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THE USE OF BOILED MILK IN INFANT-FEEDING*

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There are two distinct and entirely different reasons for boiling cow's milk during the first year of an infant's life: first, to destroy any harmful bacteria which the milk may contain, and by so doing to prevent disease; and second, to make the milk more digestible and to prevent or overcome any digestive disturbances, provided boiling has this effect. In this country the bacteriologic content of milk has attracted so much attention that we have not studied sufficiently the difference in the digestibility of boiled and unboiled milk, for we must study the problem entirely apart from the bacteriologic side.

All pediatrists are agreed that milk from healthy tuberculin-tested cows, and with a low bacterial content, is advisable for infant-feeding purposes. It is the general consensus of opinion in America that good milk need not be boiled, although some authorities are of the opinion that all milk fed to infants should be pasteurized. We are also agreed that when it is impossible to procure good milk, sickness can be avoided by pasteurization or boiling, and that one or the other is necessary when a good milk-supply is not available. The only question then, so far as the bacteriology of milk is concerned, is whether or not pasteurization or boiling of milk may be continued over a prolonged period without harmful results.

Perhaps an even more important phase of the question is whether the boiling of cow's milk so changes it that it is better borne by infants who have a low digestive capacity or who are suffering from actual digestive disturbances.

Our problem, then, divides itself into several subheads:

1. Does the prolonged use of boiled milk cause nutritional disorders, such as rickets, anemia, malnutrition, poor musculature or scurvy?
2. Does the change from unboiled to boiled milk cause digestive disturbances when fed to infants who have no difficulty in digesting unboiled milk?
3. Does the change from boiled milk to unboiled milk ever cause digestive disturbances?
4. Does boiled milk aid us in overcoming digestive disturbances such as intestinal indigestion with or without diarrhea or vomiting?
5. Does boiled milk cause constipation?
6. Is boiled milk as readily assimilated as unboiled milk, or is the nutritional value of milk lessened by boiling?

There are three ways of attacking these problems: first, laboratory experiments; second, animal experiments, and third, clinical observations on babies. There has been a great deal of work done and there is a vast amount of literature from the first and second points of view, but very little has been written on the clinical side of the question. Laboratory and animal experiments are very valuable, but the real test of any feeding problem is the actual results obtained in a series of babies who are carefully observed over a long period of time. Most of those who have written on this subject have concluded that actual clinical observations were necessary to determine the relative value and usefulness of boiled and unboiled milk in infant-feeding.

Some of the animal and test-tube experiments, although interesting and instructive, do not throw any real light on the practical problem of feeding. For instance, whether calves do as well on boiled cow's milk as they do on unboiled milk of their own species, and whether babies do as well on boiled human milk as unboiled milk of their own species cannot help us to decide the problems which I have enumerated above. At best the feeding of cow's milk to babies is an artificial procedure, and we must not allow such analogies to confuse us.

In approaching the subject from a clinical point of view, it is necessary that the babies on whom any feeding experiments are tried should have good care and the proper hygienic surroundings in order to be under the most favorable and natural circumstances. For this reason, it would be better not to take institution infants or those in the lower walks of life whose hygienic surroundings are poor. I have selected for my cases my own private patients and a few of the better class of dispensary patients whose intelligence can be relied on to carry out the directions ordered.

THE QUESTION OF NUTRITIONAL DISTURBANCE

1. Does the prolonged use of boiled milk cause nutritional disorders, such as rickets, anemia, malnutrition, poor musculature or scurvy? At the very start we must realize that in this question we are hampered by tradition. We have all been taught and have heard it repeated so many timse that boiled milk was liable to cause constitutional disturbances, that it is difficult to put oneself into the position in which his mind is open. Where this theory originated I do not know, but surely there is no conclusive evidence found in the literature to prove that boiled milk does cause these disturbances. Morse, in a very thorough review

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of the literature on the subject, says that there is relatively little evidence on either side, although he quotes Finkelstein as saying that there was no evident difference in the results with raw and cooked milk in sixty well and fifty-three sick babies. Leopold did not find any evidence of rickets, anemia or malnutrition in fifty-four infants fed with Schloss milk over a long period.

I have among my records only a comparatively small series of patients who have been fed boiled milk over a long enough period of time to be of value. The reason for this is that I also have been hampered by the tradition that boiled milk was harmful to babies, and although most of my difficult feeding cases have at some time been given boiled milk for a period of a few days or weeks, I have stopped boiling the milk as soon as they were able to take care of it unboiled. These cases, therefore, are those in which there have been digestive disturbances as soon as the boiling of the milk was stopped for a few days, when the boiled milk was again promptly resumed on account of the digestion, or those that were doing so remarkably well on boiled-milk mixtures that I hesitated in making the change to unboiled milk.

There are eighteen cases in this series, in all of which the patients received boiled milk for a period of from four to nine months, most of them for over six months during the most critical period of their feeding history. The mixtures used were simple milk dilutions, usually beginning with one-third milk and gradually increasing up to one-half milk, two-thirds milk or three-quarters milk. The carbohydrate used was either cane- or malt-sugar or malt-soup mixtures. In boiling the milk, the milk and water were first mixed together and brought rapidly to a boil, stirring constantly so that no scum formed on the top, and after it had come to the boiling point, it was allowed to boil actively for three minutes. It was then taken off the stove and put into the bottles for the day, and rapidly cooled.

Every one of these infants was carefully observed throughout this period, evidences of rickets and anemia being especially watched for. Most of them had a certain degree of malnutrition when they came under observation, and a few of them had poor bony development. Two of them, twins, had a marked craniotabes with non-union of the sutures when first seen at 6 weeks of age, which improved with noticeable rapidity so that at ten months the fontanel was normal in size, the sutures united and there was no remaining evidences of the craniotabes.

In the entire series not one developed rickets and all showed a marked improvement in nutrition and musculature, and with one exception they developed into normal, healthy infants. The condition of the skin, the hair, the color, the general alertness and sense of well-being were exceptionally good, all of which cannot be recorded in figures or be graphically shown as is so easily done with the weight chart. In other words, all but one of the series did remarkably well.

The case that did not do well was Case 13. This baby was difficult to feed throughout the entire period and had attacks of diarrhea when it was attempted to stop boiling the milk. He did not have any evidences of rickets, but gradually developed anemia with splenic enlargement. It seemed hardly fair to attribute this condition to the boiling of the milk because there were so many other considerations and the feeding itself was far from successful. This is the only case in the series, however, in which anemia developed, and also the only one in which there was malnutrition or poor musculature.

Scurvy did not develop in any. In all probability this was because orange juice was given daily throughout the period of boiling the milk. If this precaution is taken when boiled milk is given over any extended period of time, it would seem as though we might eliminate the question of scurvy. Since severe cases of scurvy can be overcome in a few days' time by administering orange juice, even though boiled milk is continued, it would be only logical to conclude that orange juice will prevent scurvy. Undoubtedly there is evidence in the literature that scurvy is produced by boiled milk feedings when orange juice is not given.

INFANTS FED WITH BOILED MILK OVER A PROLONGED PERIOD

Name	Age First under Observation, Months	Dates during which First Fed Boiled Milk	Length of Time, Months	Weight				Increased		Previous Condition	Previous Feeding
				When Boiled Milk Started		When Boiled Milk Stopped					
				Lb.	Oz.	Lb.	Oz.	Lb.	Oz.		
R. I.	1½	11/17- 6/20	7	4	13	14	..	9	3	Emaciated, poor bony development	Breast and bottle
E. J.	1½	11/17- 6/20	7	5	3	15	2	9	15	Emaciated, poor bony development	Breast and bottle
L. O.	6	7/15- 1/23	6	15	6	18	12	3	6	Good	Breast until 6 months
L. J.	4	3/ 3- 9/ 8	6	7	9	15	2	7	9	Emaciated	Eskay's Food and milk mixtures
A. R.	¼	1/31- 5/24	4	4	5	10	..	5	11	Emaciated	Weak top milk mixtures
R. C.	8	4/ 4- 8/20	4½	16	3	19	12	3	9	Fair except petit mal attacks	Milk and gruel mixture. Malted milk
P. G.	4	2/27- 8/ 7	5½	5	3	9	5	4	2	Emaciated, vomiting	Various proprietary
P. P.	1	9/10- 6/ 6	9	8	3	20	2	11	15	Fair, lost 2 lb. since birth, 7 stools a day	Breast
P. S.	1	8/25- 4/28	8	7	2	16	14	9	12	Fairly well nourished, lost 2 lb. in weight	Breast
E. T.	¾	1/19- 6/10	4½	6	4	11	5	5	1	Good, but lost in weight	Top milk mixtures
G. R.	4	5/15-11/ 9	5½	7	1	14	4	7	3	Never gained in weight	Various proprietary
R. C.	6	8/ 8- 2/10	6	10	8	21	2	10	10	Emaciated	Condensed milk
H. U.	2	4/17- 1/ 8	8½	7	4	14	10	7	6	General condition poor, intestinal indigestion	Breast and boiled milk
S. R.	1	9/10- 6/10	9	4	4	15	4	11	..	Premature, poorly developed and nourished	Breast
L. L.	4	2/ 6- 6/13	4	9	14	16	10	6	2	Fairly well nourished	Top milk mixtures
D. M.	3	10/28- 4/25	6	6	6	17	7	11	..	Emaciated	Mellin's Food
J. Q.	3	1/20- 8/27	7	10	3	18	4	8	1	Excellent	Breast

DIGESTIVE DISTURBANCES

2. Does the change from unboiled to boiled milk cause digestive disturbances when fed to infants who have no difficulty in digesting unboiled milk? It has been my custom in the last three years to use boiled milk when starting to feed infants on cow's milk for the first time, and although the majority had digestive disturbances or malnutrition, a certain number of cases were normal infants without digestive disturbances. Besides this, it is occasionally advisable to boil an infant's food for a journey or when out of town where the milk-supply cannot be relied on. In not a single instance have I ever seen this change from unboiled milk to boiled milk cause any gastric or intestinal indigestion. On the other hand, as stated below, boiled milk has repeatedly been used in infants who have digestive disturbances with the result that such disturbances were overcome. I do not know whether this would be true of top milks with high percentages of fat or not, because my experience in boiled milk is entirely limited to the use of simple dilutions of full milk or occasionally skimmed milk. Formerly in starting infants for the first time on cow's milk it was a frequent occurrence to see children with a normal digestion get up digestive disturbances, and on boiling the milk these disturbances would disappear. I have also, for experimental purposes, changed from unboiled to boiled milk in infants who were doing well on the unboiled milk, without causing digestive disturbances. This has, therefore, forced me to conclude that the change from unboiled milk to boiled milk does not cause indigestion, either vomiting or diarrhea or discomfort, which is contrary to the general consensus of opinion in this country.

3. Does the change from boiled milk to unboiled milk ever cause digestive disturbances? Further evidence that boiled milk is more digestible than unboiled milk is found in individual patients who have no digestive disturbances when given boiled-milk feedings; perhaps over a prolonged period, but who get up digestive disturbances when the boiling of the milk is stopped. As I have said, it has been my habit to boil the milk as a routine for intestinal indigestion and to continue boiling the milk for from two to four weeks after the digestive disturbances have been overcome, and then to change to the unboiled food. Within a few days or a week after this change is made, some infants will have stools which are normal in character except for a few large, tough, bean-like curds which appear in almost every stool, which seem to cause no discomfort or other symptoms. If the unboiled milk is continued, these curds may disappear and the infant goes on doing well without any further results of the change. Some infants will get up a rather severe intestinal indigestion and diarrhea either immediately after the change from boiled to unboiled milk or three or four days later. Many well infants with a normal digestive capacity stand the change very well; in fact, by far the majority of them do.

A few cases illustrating these points follow:

P. D., boy aged 1 month. Birth weight 6 pounds 2 ounces. Present weight 8 pounds 2 ounces. Temperature normal. Well nourished and developed. Previous food: Since birth fed under my directions on boiled-milk mixtures, gradually increased up to: milk, 16 ounces; water, 16 ounces; dextrimaltose, 1 ounce. Four ounces fed every three hours; seven feedings in twenty-four hours.

December 19, the boiling was stopped and for a period of five days tough, hard curds appeared in the stools, which became foul in odor, but most of the stool was fairly normal in appearance. December 24, the food was again boiled and the next day the curds disappeared from the stools and they became normal otherwise. The following day the food was again given unboiled and continued so for a period of nine days to January 4, during which time the curds were constantly seen in the stools, although they did not increase in number. January 4, the boiling of the milk put a stop to the curds and one dry crumbly stool results under the boiled milk feeding. The following day the unboiled milk was resumed, and the curds again appeared twenty-four hours after the milk was given unboiled. This continued for a period of one week, when they gradually disappeared from the stools without resorting to the boiling of the milk. Throughout this period (one month) there was a continuous gain in weight from 8 pounds 2 ounces up to 10 pounds 1 ounce, and the infant appeared perfectly well except for a little colic and crying part of the time when the curds were present in the stools.

From my observation it is very evident that infants who have been kept on boiled milks for a very long time are more easily affected when the boiling is stopped. Cases 1 and 2 (twins) of my boiled-milk series illustrate this point very nicely. They had been fed boiled milks since 6 weeks of age except on two different occasions, when it was given unboiled for a day or two at a time. On both of these occasions stopping the boiled milk caused digestive disturbances, which were soon overcome when the feedings were boiled again. For this reason the unboiled milk was not attempted again until they were 6 months of age, having been fed on boiled milk for nearly five months. They had been doing nicely in every way and were strong, healthy babies so that it did not seem necessary to continue the boiling of the milk any longer. April 5 the boiling was stopped, and on April 8, three days later, one of them developed a mild diarrhea. This one had always been a little more susceptible to any change in the food and a little more difficult to handle. April 10, five days after changing to the unboiled milk, the second one also developed diarrhea. For one week thereafter, both babies continued to receive the unboiled milk feedings. The stools gradually got worse until there were five or six mucous, curdy, watery stools a day with a great deal of restlessness and evident colic and a cessation of gain in weight, and since it was evident that they were doing very poorly and could not stand the unboiled milk, the boiled milk was resumed. It had proved to be a very severe intestinal indigestion and it was five days before the stools became normal again under the boiled-milk feeding.

In two other cases, giving only two feedings of unboiled milk a day, the rest being boiled, caused a diarrhea which stopped when the boiling of the entire feedings was resumed. After Case 9 had been fed boiled milk for one month, two feedings a day were given unboiled, September 22, the bowels then being constipated. Three or four days thereafter the stools showed a good deal of mucus and curds and the boiling was resumed with the usual result that the stools became normal again. A week later two feedings a day were again given unboiled, the rest being boiled, and again a diarrhea developed. The same experience was repeated in Case 14, after the boiled milk feedings had been used continuously for seven months.

It is impossible to prophesy whether the change from boiled to unboiled milk is going to cause digestive disturbances in an individual infant or not. Undoubtedly those infants who have been most difficult to feed and have had frequent attacks of intestinal indigestion are more liable to get up diarrhea when the boiling is stopped. The criticism naturally might be made that some or all of these diarrheas were due to an infection, but in the first place, the course and symptomatology is never that of an infectious diarrhea, as there is no rise of temperature or other evidences of toxemia. In the second place, certified milk was used, and every

precaution taken in the proper icing of the milk, care of the bottles, nipples, etc., in many instances by a trained nurse who is thoroughly familiar with the dangers of milk infection.

A very interesting experience occurred some years ago during my summer service in the babies' wards of the New York Post-Graduate Hospital, when I was first working with boiled milk. There were thirty cases of various kinds of gastro-enteritis that were being bottle fed in the wards. I had been rather blindly giving boiled milk as a routine for two weeks with varying success, during which time not a single one of the infants had any tough, hard curds in the stools. A sweeping order was given to stop boiling the milk and in almost every instance the curds appeared. In three days another sweeping order was given to boil all the milks, and in from twenty-four to thirty-six hours the stools of all the babies were free of curds. This experience has since been repeated so frequently in so many of my cases that there cannot be any doubt that changing from boiled to unboiled milk is a cause of digestive disturbances.

4. Does boiled milk aid us in overcoming digestive disturbances, such as intestinal indigestion with or without diarrhea, or vomiting? There are so many different factors that enter into the treatment of the various digestive disturbances that one must be careful when he attributes his success in treating a single case or a series of cases, to any single one of these factors, such as the boiling of the milk. The intervals between the feedings, the quantity at a feeding, the caloric value of the food, the amount and kind of sugar used, the addition of starches or dextrinized starches, the dilution, the percentages of fat and protein, the kind of milk used, the proper preparation of the food, and carrying out of the directions, all play an important part in overcoming digestive disturbances. It may be assumed that intestinal or gastric indigestion cannot be influenced by any procedure when the details are not properly carried out.

It has been my custom to begin the treatment of almost all of my cases of simple intestinal indigestion (and this does not include cases of infectious gastro-enteritis), with a mixture of about one-third milk and two-thirds water boiled as described above. No starch or sugar or alkali is added to the mixture. The simplicity of this procedure and the almost universal application of it eliminates many complicating problems, and since it is almost always successful in overcoming the digestive disturbances in the proper class of cases, it is fairly easy to determine what part the boiling of the milk plays in the success of the treatment. In other words if, in a certain class of babies, the universal use of one-third milk and two-thirds water boiled will overcome the digestive disturbances, it is only necessary to use the same mixture, unboiled, in a series of the same class of cases to determine whether the boiling of the milk is, in part at least, responsible for the good results obtained. It is very evident from my experience that many cases of intestinal indigestion cannot be successfully treated with this mixture unboiled.

The following case, picked out at random, is typical of the series of cases which were treated with boiled-milk mixtures:

A. P., boy aged 4 months 2 weeks. Birth weight 9 pounds 8 ounces. Present weight 10 pounds 8 ounces. Temperature 98.6. Skin rough, very poorly nourished, milk malnutrition, good bony development. Previous food, 7 per cent. top milk, 13 ounces; water, 19 ounces; lactose, 7 teaspoonfuls; 4 ounces every three hours; seven feedings in twenty-four hours. Stools: Six or seven in twenty-four hours, green, watery, with mucus and curds. Appetite: Hungry. Sleep: Poor. Vomiting: None.

Treatment: Milk, 10 ounces boiled; water, 20 ounces boiled; no sugar; 4 ounces every three hours; seven feedings in twenty-four hours.

In three days there were two yellow, soft, homogeneous stools without mucus or curds, which remained normal thereafter, when the milk was increased and sugar added.

In fifty-two cases treated with this boiled-milk mixture the stools became normal in from two to five days. The ages varied from 3 weeks to 1 year. The stools varied from three to twenty per day, all of them showing evidences of indigestion and most of them containing mucus and curds. As many of these cases were treated in summer as in winter. The weights varied from 4 pounds 5 ounces to 19 pounds 4 ounces, the majority of them being small, emaciated, young infants. The previous feeding varied from simple barley gruel, which in some cases had been used for a prolonged period without overcoming the diarrhea, to the more complicated top milk and whey mixtures and the various proprietary foods. There were all grades of intestinal indigestion, but no acute infectious diarrheas are included in the group, as it would seem as though such cases have too many complicating elements to be of any value in deciding whether boiled milk is more easily digested than unboiled milk. However, it may be said in passing, if boiled milk is more easily digested than unboiled milk it would naturally follow that cases of acute infectious diarrhea which require milk feeding should receive the milk boiled.

The series of cases in which the unboiled milk was used in the same dilution is small, because of the poor results obtained, as it did not seem fair to the infants to allow them to continue with the unboiled milk since the stools did not improve under this treatment. A typical case treated with the unboiled milk is as follows:

L. L., girl aged 4 months. Weight, 9 pounds 14 ounces. Temperature, 98.6. Skin, smooth. Poorly nourished, good bony development. Previous food: Ten per cent. top milk, 5 ounces; water, 20 ounces; lime-water, 2 teaspoonfuls; milk-sugar, 4 teaspoonfuls. Stools: Three, loose, watery, with much mucus and curds. Vomiting: A great deal at every feeding. Appetite: Ravenous. Sleep: Poor.

Treatment: Milk, 10 ounces, unboiled; water, 20 ounces, unboiled; no sugar; 4 ounces every three hours; seven feedings in twenty-four hours.

At the end of a week the stools were not only not improved but were more numerous, and large, tough curds took the place of the soft, fatty ones. The food was then boiled and in three days more the stools became smooth, homogeneous, free of curds and mucus.

There were ten cases in this series which included the same kind of babies as in the boiled-milk series. In only two did the stools clear up without resorting to the boiled milk, and those were infants that had formerly been receiving extremely bad feeding, one a very high fat and the other very high sugar. In the other eight the diarrhea was allowed to go on for seven days in three cases, nine days in three cases, and twelve days in two cases, before the boiled-milk feedings were instituted. In all of these cases the stools became normal inside of five days after beginning the boiled milk.

These boiled-milk mixtures are particularly useful in the small, young, poorly nourished infants, who do not do well on an exclusive carbohydrate diet, such as is so frequently given for a few days before starting milk feedings. It is probably the experience of all of us that the older, well-nourished infants, say above 6 months of age, who have intestinal indigestion, are best treated with either an entire cessation of food for from twelve to twenty-four hours, or a starch diet such as the various gruels and perhaps bread pap. But the younger, smaller infants and those with malnutrition who are suffering from the lack of food do not do well with this treatment. It is not an uncommon experience to see infants of this class that have been fed barley-gruel for a period of a week or more with no improvement in the stools and with a marked loss in weight and strength.

It is not easy to determine the effect of boiled milk on the gastric digestion. Often severe vomiting was stopped or the severity much diminished when boiled-milk mixtures were given in simple dilutions. However, this generally occurred in infants who came under observation for the first time, and whose feeding had previously been more or less irrational. Besides that, the sugar is usually cut down in amount and many other proper changes are made. On the other hand, there are certain infants whose vomiting does not stop with the boiling of the milk.

I have certainly never seen vomiting caused by the change from unboiled to boiled milk, nor am I sure that I have seen it caused by the change from boiled to unboiled milk. Undoubtedly the large, tough curds that are seen in the stools of some infants fed with unboiled milk are originally formed in the stomach, and unboiled milk stays in the stomach longer than boiled milk, both of which facts Brennemann has shown.

CONSTIPATION

5. Does boiled milk cause constipation? Constipation in the bottle-fed has so many different causes that it is difficult to prove what part the boiling of the milk plays in its etiology. In many of my patients who were constipated when the boiled milks were started, the constipation was overcome during the period that the boiled milk was fed. In others the constipation persisted while on boiled milk but was relieved when unboiled milk was given. Still others who were constipated on the boiled milk feeding were just as constipated after the feeding was changed to unboiled milk. None of the babies that received the malt-soup mixtures were constipated at any time while taking this food, which shows that even if constipation is caused by boiled milk and water mixtures, adding certain elements to the food will overcome the constipation in spite of the boiling. Infants who have diarrhea at the time that boiled milk is instituted often acquire a much welcomed constipation. The constipation is then usually overcome as sugar is added to the food, and the food is increased in quantity and strength.

Of the thirty-one babies that were constipated at some time while they were receiving boiled milk as a food, in nineteen the constipation was overcome before the food was changed to unboiled milk, in six the constipation was relieved by stopping the boiling and in six others the constipation persisted in spite of the change from boiled to unboiled milk.

It would seem that although constipation more frequently occurs in babies fed on boiled milk, in certain cases it may be overcome while the baby is fed on boiled milk, and stopping the boiling does not always stop the constipation.

NUTRITIONAL VALUE

6. Is boiled milk as readily assimilated as unboiled milk, or is the nutritional value of milk lessened by boiling? This is a phase of the question that cannot be decided by clinical work. There is a certain loss of fat and protein when a scum is allowed to form on top, but if the milk is stirred constantly and brought to a boil rapidly this scum is not formed. It is my opinion that even when this detail is carried out, there is a small loss in the nutritional value of the milk. My only evidence, which is not at all conclusive, is based on the increase in infants' weight on stated amounts of boiled and unboiled milk.

CONCLUSIONS

1. Clinical evidence of the comparative usefulness of boiled and unboiled milk in infant-feeding is of value and desirable.
2. The prolonged use of boiled milk if properly administered does not necessarily cause nutritional disorders such as rickets, anemia, malnutrition or poor musculature.
3. Scurvy may be avoided when boiled-milk feedings are given, by the administration of orange juice.
4. Boiled milk does not cause digestive disturbances in normal infants, and is, therefore, not more difficult to digest than unboiled milk.
5. Boiled milk aids us in overcoming digestive disturbances.
6. The change from boiled milk to unboiled milk may or may not cause digestive disturbances.
7. Boiled milk is probably more apt to cause constipation than unboiled milk, but in certain cases the constipation may be overcome while on boiled milk, although it is not always overcome when the boiling is stopped.
8. The evidence is not conclusive whether the value of the milk is lessened by boiling or not.

ABSTRACT OF DISCUSSION

DR. FRANK C. NEFF, Kansas City: I think if one looks over his case-records of scurvy he will find it more or less difficult to determine just what sort of feeding has been responsible for this. I was interested in the report of Dr. Brennemann in which he stated that recovery ensued in a well-developed case of scurvy from the use of boiled milk; there was no other food and no other medication and it cleared up as quickly as scurvy often clears up under the administration of fruits. I have also seen cases of scurvy develop during the administration of raw milk. Such a case I saw last year. One is inclined to doubt that a moderate heating of milk has any relation to the production of scurvy.

DR. L. T. ROYSTER, Norfolk, Va.: I give percentage feedings as a routine, using cream, skimmed milk, water and carbohydrates. I also believe in using home modification when possible. We have in Norfolk good certified milk, also a laboratory. I have also a number of patients coming from the surrounding country for many miles, who cannot get either laboratory milk or certified milk, and in those cases I use home modification. The milk-supply being so doubtful, I never hesitate to boil the milk and have never seen any deleterious results therefrom. As a rule I use orange juice in those cases, but sometimes do not, and have never seen any bad symptoms, even in cases in which the orange juice was not used. I saw some of Dr. Leopold's cases last summer and followed them with much interest, and, having a number of institution patients myself, tried the treatment on

them on my return. I got good results in the majority of cases. Some of them, especially when there was bad nutrition to start with, did not show as good results as a fairly normal child on normal feeding. Referring to the oft-discussed question of institution babies, one of the main reasons why institution babies do not do well is that they do not get as much individual care as a home baby. I believe whenever you go beyond four babies to a nurse in an institution you are on the ragged edge, and the further you get away from that, the poorer will the results be. In my own experience, when I have one nurse to four babies, I practically never have a case of institutionalism develop. I also believe that harm from boiled milk has been much overrated.

DR. H. LOWENBURG, Philadelphia: I have been using boiled milk for the last three years, usually in combination with flour, or old-fashioned flour-ball. My results have been according to Dr. Dennett's observations that it has an excellent effect on the stools, immediately causing disappearance of the curds, and change in color to golden yellow. My attention was called to an article in THE JOURNAL, Feb. 22, 1913, p. 575, by Brennemann, who did a lot of experimental work showing the effect of coagulants on the curd of boiled milk, and indicated clearly that these curds resembled human milk more than the unboiled milk. The possibility of scurvy has always interested me also. Every time I get a case of scurvy I cure the patient with raw milk, and I have never had a case of scurvy develop in my own work. That is probably due to the fact that all the children get beef broth and vegetable broth. I never use orange juice.

DR. CHARLES DOUGLAS, Detroit: As to boiled or pasteurized milk, from twelve to fifteen years ago I was a very strong advocate of raw milk. I talked it among my patients and used it, and I found, after doing so for a few years, that my results from boiled milk were much better. I would not think of going back to raw milk. Scurvy is so easily cured that I do not think it is worth talking about. If I see any suspicious symptoms I put in a little orange juice and get rid of scurvy in that way. With regard to the curds in raw milk, if the amount of raw milk is reduced 1 or 2 ounces in the day's feeding, the curds will disappear. The change to boiled or pasteurized milk impressed me that a child could not digest as much raw as boiled or pasteurized milk, as curds did not appear when the latter was given.

DR. GEORGE DOW SCOTT, New York: I believe milk is changed through boiling. It seems to me that when the cow gives a natural food, boiling it is not only unnecessary but harmful. When we get a physiologic food from the cow it is only necessary for us to modify it in the raw state sufficiently so the child can take it. I see advantage over the old wine-whey, in Schloss' mixture. If raw milk is modified with the proper amount of fat protein and carbohydrate, the child will progress. The question of scurvy is always brought forward. Recently I read an article in New York quoting over 100 different authors on scurvy. I had to wake my audience up every little while because it was going to sleep listening to my numerous quotations. I think scurvy comes from a poor condition of the milk due to delay in handling and in getting it from the dairy to the consumer. That certainly has much to do with it. I do not agree with Dr. Douglas that scurvy can be cured in a few days. I think it is a long-drawn-out condition, and takes prolonged treatment to cure.

DR. G. W. GRAVES, New York: I have seen no less than four severe cases of scurvy develop under boiled-milk feeding, in the hands of perfectly competent practitioners, and know that the condition has been most serious in the eyes of the families. The children have been quite ill and have suffered excruciating pain; and the anemia has been very marked. When boiled milk cannot be found to be the cause in such cases, pasteurized milk may be. ("Raw" milk is a term very frequently applied to pasteurized milk.) Boiled milk has a distinct value, but when cooked milk is used, it cannot be emphasized too strongly that orange juice, potato water, or some other antiscorbutic should be employed.

DR. J. L. MORSE, Boston: It does seem a great pity to speak of any rule or method of infant-feeding. There are just two reasons for boiling milk—one is that bacteria are in the milk, the other is that there is a disturbance of the casein digestion. We know that boiling the milk will kill bacteria and that it makes the digestion of casein easier. When we have casein indigestion, boiling is one way to correct it. I would rather feed babies continuously on raw milk than on boiled milk. As to whether boiled milk causes scurvy, the only statement we can make regarding the etiology of scurvy is that no one knows anything about it. We all have certain ideas. I have found that, during the last few years, the condition which has been more constantly present than any other in the feeding of the babies which I have seen with scurvy, is that the milk has been heated in some way. Yet I feed babies on both boiled and raw milk.

DR. ROGER H. DENNETT, New York: I do not agree with Dr. Morse's last statement. I do not believe that, after an extensive use of boiled milk, anybody can possibly say the boiling of milk has no effect except in destroying bacteria and in overcoming protein indigestion. I have seen, for instance, an infant that has had a prolonged diarrhea treated perhaps for a week or two with barley gruel, which we all agree is a mistake. Inside of three days after feeding this child boiled-milk mixture the stools were back to normal for the first time. This infant was having three, four and up to seven loose, mucous stools a day, and inside of three days of the boiled-milk feeding, the stools became normal. This is not protein indigestion. As I have shown in my paper, the same results cannot be obtained with the same feedings when the milk is given raw. Babies will stand a higher protein better when the milk is boiled.

FRAGILITAS OSSIUM*

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In 1897 Dr. Griffith[1] was able to collect sixty-seven cases of "idiopathic osteopsathyrosis" in infancy and childhood. He included under this head all cases of multiple fractures occurring before birth, at birth and after birth, in which no cause for the bone fragility could be found. The German writers still use the term "osteogenesis imperfecta" for the cases found at birth, while the French call them *"dysplasie periostale;"* and both reserve "idiopathic osteopsathyrosis" for the condition of multiple fractures, of an unknown cause, occurring later in infancy and childhood. There can be little doubt now that these two conditions are identical, being but different stages of the same disease, as is shown by Axhausen,[2] Bamberg,[3] Frangenheim,[4] Hagenbach,[5] Hammond,[6] Hartmann,[7] Lipschütz,[8] Looser,[9] Matsuoka,[10] Porak and Durante,[11] M. B.

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* Because of lack of space this article is abbreviated in THE JOURNAL by omission of tabular matter and accompanying references. The complete article appears in the Transactions of the Section and in the author's reprints. A copy of the latter will be sent by the author on receipt of a stamped addressed envelope.

1. Griffith, J. P. Crozer: Am. Jour. Med. Sc., 1897, new series, cxiii, 426.
2. Axhausen: Gedenkschrift für Rudolph von Leuthold, 1906, ii, 525; Deutsch. Ztschr. f. Chir., 1908, xcii, 42.
3. Bamberg and Huldschinsky; Monatschr. f. Kinderh., 1911, x, 325.
4. Frangenheim, Paul: Ergebn. d. Chir. u. Orthop., 1912, iv, 134.
5. Hagenbach, E.: Osteogenesis imperfecta tarda, Chir. Habit. Schrift, Basel, 1911; Frankf. Ztschr. f. Path., 1910-11, vi, 398.
6. Hammond, Roland: Am. Jour. Orthop. Surg., 1911-12, ix, 615.
7. Hartmann: München. med. Wchnschr., 1911, lviii, 922; Deutsch. Ztschr. f. Chir., 1911, cxi, 383.
8. Lipschütz, Alexander: Berl. klin. Wchnschr., 1908, xlv, 866; Wien. klin. Rundschau, 1911, xxv, 37, 55, 69, 87 and 105.
9. Looser, E.: Mitt. a. d. Grenzgeb. d. Med. u. Chir., 1905-6, xv, 161.
10. Matsuoki, M.: Deutsch. Ztschr. f. Chtir., 1909, xcviii, 407.
11. Porak, C., and Durante, G.: Nouv. iconog. de la Salpétrière, 1905, xviii, 507.

Schmidt,[12] Schuchardt,[13] Sumita,[14] Ziegler[15] and others. The name originally given to this condition, together with "achondroplasia" ("chondrodystrophy foetalis"), was "congenital or fetal rickets." At that time "achondroplasia" had not yet been differentiated from "osteogenesis imperfecta." Birnbaum[16] noted but one case of "osteogenesis imperfecta" among 4,500 births in the Göttingen clinic, showing how very rare the condition is. Vrolik[17] first used the name "osteogenesis imperfecta;" Lobstein[18] called it "osteopsathyrosis"; Kundrat[19] called it "osteoporosis congenita"; Marchand[20] called it "osteomalacia congenita;" Klebs[21] and Hochsinger[22] used the term "fragilitas ossium." We prefer "fragilitas ossium" since it accentuates the chief clinical symptom of the disease.

We have used the term "fragilitas ossium" to include both types of cases, (1) the fetal type found either at birth or soon afterward, associated with imperfect bone formation and multiple fractures (imperfect osteogenesis or periosteal dysplasia), these cases commonly not surviving beyond the second year of life; and (2) the congenital type, found in infants and children, at birth or later, with fractures recurring often until puberty or even until adult life, associated with similar bone changes (idiopathic osteopsathyrosis), which children if well cared for, survive, but often in a badly crippled condition. Our extensive review of the literature has brought to light 126 cases since 1897. Like Dr. Griffith, we have rigorously excluded symptomatic cases (with three fractures or less) for which any cause could be discovered, such as secondary absorption due to rickets, osteomalacia, scurvy, or old age; osteomyelitis or tuberculosis of bones; syphilis, nervous affections, tumors, cysts, etc.

We report the following case from Dr. Griffith's service at the University Hospital. For permission to make this report we are indebted to Dr. Griffith; for the case-history, to Dr. M. B. Magoffin.

CASE REPORT

History.—A girl, 3 years old, of Russian-Jewish parentage, was admitted March 25, 1913. She was breast-fed up to one year; since then she has been carefully fed. She never had much indigestion. There are three other children, living and well. There is no history of fracture on either side. Her only illness was whooping-cough during the winter of 1912-13. Her mother states that "she breaks her leg almost every time she tries to stand up." At 1½ years she broke her left femur; at 22 months, right femur; at 2 years, left femur; at 26 months, left femur; at 28 months, right femur; at 31 months, left femur, and on March 21, 1913, at 3 years, she fractured her left humerus. She had bumped into a door gently.

Physical Examination.—She is quite intelligent, noting everything about her, and very much spoiled. Though undersized, she is fairly well nourished; skin is warm and moist; musculature is good, except in legs. Head and face are broad, showing marked protruberance of the parietal bones, just above and in front of the ears. Both sclera are deep blue in color. Her ears, nose and mouth are apparently normal. There is no craniotabes. Her neck is short. The posterior cervical glands on the left side are markedly enlarged and hard. Thorax is pigeon-breasted, with prominent sternum. Expansion is good; both sides equal. The lungs are normal both to percussion and auscultation. The heart dulness extends from just outside the right edge of the sternum to the left midclavicular line and upward to the third rib. The apex beat, which is not visible, is palpable in the fifth interspace, in the midclavicular line. A soft blowing systolic murmur is audible; the second sound at the pulmonary area is accentuated. The rhythm is rather irregular and occasionally a beat is omitted. Her pulse is small, of moderate tension. The liver is palpable just below the costal margin. The spleen is not palpable. The inguinal glands are somewhat enlarged and hard, on both sides. There is considerable forward bowing of both femora, the evident result of the many fractures. Her left humerus is in plaster. Knee-jerks are normal on both sides. Examination of the blood showed erythrocytes 4,550,000, and leukocytes 10,200, with 48 per cent. polymorphonuclears, 1 per cent. mononuclears, 48 per cent. lymphocytes, and 3 per cent. eosinophils. Both von Pirquet and Wassermann reactions were negative.

Measurements, made with a pelvimeter (April 4, 1913), compared with those of a normal child then in the ward, were:

	Our Case	Normal Child
	cm.	cm.
Biparietal diameter	14¾	14
In front of ears (4 cm. below that above)	15¼	12
Occipitofrontal diameter	16½	17½
Nasal to base of occiput	12	13½
Between malars	10½	11
Root of nose to top of chin (mouth closed)	9	9
The measurements with a tape-line were:	Inches	Inches
Circumference of head at parietal eminence	19⅞	20¼
Occipital protruberance to base of nose	12⅛	12⅜
Neck	8⅞	9½
Circumference just above ears	18⅞	19¼
Half-circumference just above ears (posterior)	9½	9⅝
Half-circumference just above ears (anterior)	9⅜	9⅜

Before a Roentgen-ray picture was taken she developed gonorrheal vulvovaginitis and was immediately sent to the Philadelphia General Hospital. Diligent search again led to her discovery six weeks ago, the family having moved three times. She is now even more spoiled than last year, and has broken each femur once in the past year, the left when 41 months old, the right at 45 months. She recovered rapidly each time and now manages to walk about a little, by holding on to chairs, etc. The family are constantly expecting her to break her legs again. There is more bowing of the femor and slight atrophy of the muscles of the legs. Her parents refuse to allow her to be removed to the hospital even for a Roentgen-ray photograph; in fact they refuse to allow her to be touched, she is so afraid of doctors. She looks quite anemic. To resume: Between the ages of 1½ and 4 years she has had nine fractures, breaking her left femur five times, right femur three times and left humerus once.

Dr. Griffith has also kindly given us notes of another case, which occurred in his private practice (1905-1906). This case appears in the table as No. 43. We have tabulated from the literature 124 cases, in addition to the 67 cases collected by Dr. Griffith in 1897, making 193 cases altogether. Besides, we learn that Dr. Walz showed a patient at the meeting of the Aerztlicher Verein, Stuttgart, on October 10, 1912,[23] but we have been unable to find any details of this case. Nor was it possible to procure a copy of

12. Schmidt, M. B., in Aschoff, L.: Pathologische Anatomie, 1913, ii, 193.
13. Schuchardt, K.: Deutsch. Chir., 1899, No. 28, p. 65.
14. Sumita, Masao: Deutsch. Ztschr. f. Chir., 1910, cvii, 1.
15. Ziegler, Ernst: Lehrbuch der speziellen pathologischen Anatomie, ii, 162.
16. Birnbaum, Richard: Klinik der Missbildungen und kongenitalen Erkrankungen des Fötus, Berlin, 1909, p. 186.
17. Vrolik: Tabulae ad illustrandam embryogenesin hominis et mammalium, Amsterdam, 1845.
18. Lobstein: Traité d'anatomie pathologique, 1833, ii, 204.
19. Kundrat, Hans, quoted by Paltauf: Der Zwergwuchs, Vienna, 1891.
20. Marchand: Tagesblatt der 58 Sammlung deutscher Naturforscher und Aerzte, Strassburg, 1885, p. 422.
21. Klebs: Arch. f. exper. Path. u. Pharmakol., 1874, ii; Handbuch der allgemeinen Pathologie, Jena, 1889, ii.
22. Hochsinger, C.: Verhandl. d. Versamml. d. Gesellsch. f. Kinderh., deutsch. Naturf. u. Aerzte, 1908, lxxx, 337; Wien. klin. Wchnschr., 1908, xxi, 1614; Wien. med. Wchnschr., 1909, lix, 745.
23. Walz: Deutsch. med. Wchnschr., 1913, xxxix, 45.

the dissertation of Fridericia Gräfin von Geldern-Egmond (Zurich, 1897), in which another case is recorded.

It will be noted that in eleven of these cases, how long the infant lived was not known at the time the case was reported. The age at death was recorded in twenty-four cases, the oldest having reached 22 months.

The sex of the 117 infants born alive was noted as male in 62 (53 per cent.); female in 37 (31 per cent.); not mentioned in 18. The first fracture occurred between birth and 3 years in 64 (73 per cent.); from 4 to 11 years in 11 (13.5 per cent.); while the last fracture occurred under 13 years in 34 (42 per cent.); between 13 and 21 years in 28 (34.5 per cent.); between 22 and 41 years in 5 (6 per cent.). In seven cases the time of the first fracture, in 15 the time of the last fracture was not mentioned. The latest fracture recorded occurred at the age of 41 years. The bones of the legs, especially the femora, were most frequently broken. In number the fractures varied from 4 to 106. The cause of the fractures was usually trivial, without force or injury.

In only eight cases (9.8 per cent.) was the condition known to have existed in either parent; while brothers or sisters suffered from fractures in 24 cases, (29.6 per cent.). Although Frangenheim[115] states that the majority of these infants are born dead or die soon after birth, our tables show 82 patients living (65 per cent.), 33 cases dead (26 per cent.), with the result unknown in 11 cases (9 per cent.). In 43 cases (52.5 per cent.) the condition was noted as decidedly crippled; in 32 (39 per cent.) the patients were not disabled, while in 7 cases they were too young to record any result. In six of these 32 patients the presence of dark blue sclera was noted. The association of dark blue sclera with brittle bones, as was observed in our case, has been commented on by Stephenson,[116] Harman,[117] Burrows,[118] Rolleston,[119] Conlon[120] and Cockayne[121].

BONE CHANGES

The best description of the bone changes is given by Nichols.[122] "There is evident lack of formative power in the bone tissues. Instead of new bone being formed by normal osteoblasts on a cartilaginous matrix, the bone trabeculae are produced by calcification of the cartilage cells. Both layers of the periosteum are thickened, forming non-laminated or imperfectly laminated dense bone, with no Haversian canals, but large marrow spaces, in which there are few trabeculae. The marrow is abnormal, containing much connective tissue. The trabeculae are studded with flattened osteoblasts, but there is no evidence of osteoid tissue. The process of bone formation is checked and abnormal. Metaplasia of cartilage is much greater than normal, while bone deposition is much less. The formation of periosteal bone is abnormal and incomplete." Frangenheim[4 and 115] also notes the imperfect bone production, with increased absorption of the scanty bone trabeculae. The bone productibility of the periosteum is distinctly inhibited. That there is sparse bone proliferation with increased absorption of bone substance is mentioned by Scheib,[11] Helwig[17] and Harbitz.[51] Harbitz[51] notes that the bones contain much less calcium salts than normal. Maier[58] also noted the lack of calcium salts and the "concentric bone atrophy." He calls attention to the fact that while the long bones are bowed, there is no real shortening; they are much thinner and their structure is changed. Nathan[76] lays stress on the bowing of the long bones which are not truly shortened. M. B. Schmidt[12] believes that there is normal or somewhat delayed proliferation in the cartilage, with scanty bone production on the part of both marrow and periosteum; as a result, the bones are thin, porous and very fragile. Very few osteoblasts can be found in any part of the skeleton.

Ziegler[15] states that the marrow cavity enlarges and the bone becomes porous and fragile. Thus fractures result readily. Doering[107] and Rebbeling[66] believe that the productibility of the periosteum is increased and that dysplasia occurs through abnormal absorption on the periosteal surface of the bone. The marked atrophy in the thickness of the diaphyses which results, is commented on by Schuchardt,[13] Rebbeling,[66] O. Schmidt,[65] Looser[9] and Kaufmann.[123] Lange[91] believes the fragility to be due to the fact that while normal absorption goes on inside the compact substance, no periosteal layers are laid down outside, so that the cortical layer becomes thin, bends and finally fractures. Sumita[13] describes a functional inability of the periosteal osteoblasts, with normal enchondral preparatory processes. Michel[28] found such marked diminution in periosteal bone formation that the bones were merely shells of calcified bone spicules. Goldthwait, Painter and Osgood[124] note that the process of bone formation is everywhere checked and abnormal. Klotz[37] states that the faulty bone production is the result of imperfect metaplasia of the perichondrium into periosteum. He considers this due to lack of stimulus, or to some inhibiting force acting on the osteogenetic tissues. Hildebrandt[40] believes that some injurious substance circulating in the blood prevents the absorption of cartilage and the formation of bone substance.

The fractures, which occur in the diaphyses only (Maier[58]) depend on structural changes in the bone (von Recklinghausen[64]). Kardamatis[59] believes that these changes in the structural relations must explain the spontaniety of the fractures of the bone substance. Lindemann[44] considers the primary affection to be of the marrow, with secondary changes in the periosteum. He found small cell infiltrations most marked in the marrow cavity and blames these for the occurrence of the fractures. Frangenheim[4 and 115] also believes that the cause probably lies in the abnormal marrow, which is not able to produce normal functioning osteoblasts.

The only blood count which was unusual was reported by Maier,[58] giving an increase of eosinophil leukocytes up to 14 per cent. In our case the eosinophils were only 3 per cent.

The diagnosis is not difficult in cases of the imperfect osteogenesis type. There is a premature or full term fetus, either born dead or living less than two years, showing more or less imperfect cranial ossification (sometimes with a membranous cranium), apparently shortened, bowed extremities and multiple fractures, both old and recent. In cases of the idiopathic

115. Frangenheim, Paul, in von Brun, P.: Neue Deutsche Chirurgie, 1913, x, 45.
116. Stephenson, Sydney: Ophthalmoscope, 1910, viii, 330.
117. Harman, N. Bishop: Ophthalmoscope, 1910, viii, 559.
118. Burrows, Harold: Brit. Med. Jour., 1911, ii, 16.
119. Rolleston, J. D.: Proc. Roy. Soc. Med. (Child. Sec.), 1911, iv, 96.
120. Conlon, F. A.: Boston Med. and Surg. Jour., 1913, clxix, 16.
121. Cockayne, E. A.: Ophthalmoscope, 1914, xii, 271.
122. Nichols, Edward H.: Keen's Surgery, ii, 51.
123. Kaufmann, Eduard: Lehrbuch der speziellen pathologischen Anatomie, 1911, ii, 663.
124. Goldthwait, J. E., Painter, C. F., and Osgood, R. B.: Diseases of the Bones and Joints, 1909, p. 505.

osteopsathyrosis type, the diagnosis is no more difficult, for multiple recurring fractures in infants and children, without explainable cause, could be due to nothing else.

The relationship between fragilitas ossium and achondroplasia is certainly close. According to Jansen[125] the short extremities in both conditions are due to compressibility of the scleroblastema by enhanced amnionic pressure and to vulnerability of the fast-growing cell groups. He believes that a small amnion must be formed in these cases. Cases of the imperfect osteogenesis type may resemble achondroplasia: in both instances the extremities appear shortened, the long bones bowed or curved, and the facial expression seems similar. But as Dieterle[38] notes, the primary changes in achondroplasia are in the cartilage, while in fragilitas ossium there is a functional disturbance of both periosteum and endosteum. Zurhelle[23] states that achondroplasia shows scanty growth of the cartilage cells and early cessation of enchondral ossification, while in fragilitas ossium there is functional inability of the periosteal osteoblasts, with resulting scanty bone production and normal or almost normal enchondral ossification. Hochsinger[126] explains that in achondroplasia the short limbs come from limitation of linear growth in the long bones; in fragilitas ossium from multiple fractures and bending of the shafts of the long bones as the result of a faulty process of ossification. Hartmann[7] calls attention to the value of the Roentgen ray in diagnosis, since it demonstrates the marked disappearance of bone substance in the lower extremities. Mourad[49] believes that the epiphyseal lines in the Roentgen-ray photographs make the diagnosis between fragilitas ossium and achondroplasia certain. This imperfect bone formation and the multiple fractures readily separate fragilitas ossium from achondroplasia.

Rickets and osteomalacia must also be differentiated from fragilitas ossium. Besides the bone changes, if fractures occur, they are few (less than three or four), and they occur with some injury. Rachitic changes have been noted during infancy in several of the cases of fragilitas ossium reported; but Roentgen ray and histological examinations later have excluded rickets. Hochsinger[22] reiterates the fact that fractures are rare in rachitis. Wieland[127] asserts the now general belief that there is no such condition as congenital rickets; while Escher,[128] in exhaustive investigations, was unable to find anything to make the diagnosis of congenital or fetal rachitis tenable. Reyher[129] considers it important not to let any case of rickets be included among the cases of fragilitas ossium.

Though cases of so-called "juvenile osteomalacia" have been reported by Axhausen,[2] Rees[37] and Anschütz,[93] careful observers have classified their cases as either fragilitas ossium or true rickets. Looser[9] called some of them cases of late rickets. But he is certain that no general disturbance of nutrition can cause fragilitas ossium. Scholz[89] thinks that it would look as though the cases of "juvenile osteomalacia" and fragilitas ossium were but different forms or stages of the same process. Schuchardt[13] defines osteomalacia as a lack of calcium in the finished bone, which is limited in its growth. The effects of softening are noted only in the diaphyses, which fact distinctly separates osteomalacia from rachitis. And the occurrence of few fractures, only rarely, and with serious injury, separates both rickets and osteomalacia from fragilitas ossium. Klose[90] says that "even if rickets or osteomalacia be considered the cause of fragilitas ossium, the question of the etiology of the high-grade fragility is not solved. Repeated fractures do not belong to either rickets or osteomalacia and we must see a special pathogenesis, etiology and anatomy in cases in which multiple fractures occur."

125. Jansen, Murk: Achondroplasia; Its Nature and Cause, Leiden.
126. Hochsinger, C.: Centralbl. f. Kinderh., 1909, xiv, 43.
127. Wieland, Emil: Jahrb. f. Kinderh., 1908, lxvii, 675; ibid., 1909, lxx, 539.
128. Escher, C.: Jahrb. f. Kinderh., 1902, lvi, 613.
129. Reyher, P.: Ergebnisse der inneren Medizin und Kinderheilkunde, 1908, ii, 627.

PROGNOSIS

The prognosis is usually unfavorable. In spite of the best care fractures recur without much cause and over one-half of all patients remain badly crippled as a result. In 76.5 per cent. of our cases the last fracture occurred under 22 years of age, yet our records show fractures as late as 33, 38 and 41 years. While in 39 per cent. of our cases the result is given as fair, it should not be forgotten that reports of later conditions in these patients are not available; were they recorded, more badly crippled cases would undoubtedly be added to the list.

TREATMENT

The treatment, outside of the local treatment for each fracture as it occurs, consists in attempting to prevent the recurrence of fractures. When infants, these children are carefully guarded on mattresses, and they are hardly permitted to move. Fresh air, careful hygiene and good food are of importance. Cod liver oil, phosphorus and calcium salts have all been given, but without much result. As the etiology remains undiscovered, no beneficial method of treatment has as yet been found. Undoubtedly the condition is congenital; it would seem probable, therefore, that some fault of metabolism in the pregnant woman is the cause of fragilitas ossium in her offspring.

ABSTRACT OF DISCUSSION

DR. E. A. PARK, Baltimore: Will Dr. Ostheimer state why the name "osteogenesis imperfecta" would not be more appropriate than fragilitas ossium? Apparently the process is a specific one. There is a general activity of the osteoblasts throughout the bones, both at the junction of the cartilage and bone and in periosteal ossification. It seems to me osteogenesis imperfecta would be more proper. There is nothing in the term "fragilitas ossium" which implies a specific process. In the multiple fractures in rachitic bones, for instance, certainly a condition of fragilitas ossium obtains, but the picture in that condition is distinctly different from that which Dr. Ostheimer has described.

Pedagogy Among the Chronic Insane.—E. F. Leonard, in the *Institution Quarterly* for September 30, reports an experience incident to his service on the staff of the Jacksonville (Ill.) State Hospital. An unusually obstinate patient was by degrees drawn out to take an interest in magazines and was one day found surrounded by a group of patients to whom he was reading and explaining an article. The reading circle grew and the hitherto morose patient's condition improved. He was persuaded to start a school among the other patients of his ward. The school was taken seriously by teacher and pupils (all patients); a library was instituted, a singing school and Sunday school started, and the ward, which had previously been somewhat violent and hard to interest even in a daily newspaper, gradually improved. The work was in progress for about four years, during all of which time the interest was sustained. The teacher patient was finally discharged from the hospital as recovered and is now earning a living for his family.

PREVENTIVE OTOLARYNGOLOGY*

BURT R. SHURLY, M.D.
DETROIT

We are suffering mentally, physically and financially from too many medical societies, too many new instruments and accessories and too many surgical operations with the name of the surgeon as the distinguishing pennant of the operation. It will soon be time to appoint a board of censors centrally located to which instruments and operations may be presented and which will approve those worthy of attention before the profession and public are subjected to so-called improvements.

The practitioner and specialist of this country is particularly distinguished for a keen uplifting interest in humanity, a broad sympathy and a devotion to the greater comfort and general welfare of the patient. It is still true, however, that the most noble and skilled exponent of our special art must pay homage and reverence to the greatest queen of all—Dame Nature; her ways of prevention, medication and cure must be ours.

The mind of the medical man in the last two decades has originated, elaborated, improvised and invented innumerable systems, methods and instruments to eliminate pathologic or other tissue from the nose, throat or ear, yet the pages of our literature on preventive methods of procedure in our specialty have been few indeed. The question of when not to operate may be uninteresting, but as a valuable consideration in the saving of life it is frequently as important in otolaryngology as in the surgery of the appendix.

It is unnecessary for us to follow the Mohammedan custom of daily chant, and open our office each day with a recital of the Hippocratic oath and ten laws of Dame Nature which must be obeyed, but it is fitting and proper that we should frequently ponder on the great and serious responsibilities of our calling. This applies especially to our overzealous radical colleagues who seem to consider surgery the only road to success. It takes a conscience, introspection, sympathy and a true sense of responsibility to realize that the limitations of one's individual surgical ability and training must be the guiding stars of decision and judgment. The value of any instrument, operation or method depends on proper selection and use.

Are we to ligate the carotid for tonsillar hemorrhage? Yes, if necessary; but if a brilliant and dexterous general surgeon is in an adjoining operating-room he should be called in as he can accomplish the work skilfully in half the time it would take a laryngologist. The old adage "An ounce of prevention is worth a pound of cure" applies to otolaryngology and may be resuscitated at this time with advantage. Prophylaxis is the text of the dentist as he merrily bores into the decayed tooth. We hear the pathologist assert that immunity and heredity explain the problem. Eugenics will reform the world, says the pediatrist. Sanitary science, hygiene and quarantine are the interesting themes of the internist.

The subject of preventive otolaryngology may be classified to include a system of observances that will offer the best protection or prevention to the individual or community of diseases of the nose, throat or ear.

Preventive medicine will not be appreciated by the laity or profession until a secretary of public health in the cabinet at Washington shall organize, develop and promote this subject with its special branches for the benefit of humanity.

The practical importance of the prevention of disease in the upper respiratory tract and the accessory channels of the ear grows on one as it is viewed from the biologic, sociologic, pathologic, or therapeutic point of view. Under the subclassification of protective otolaryngology it is possible to accomplish much of great practical value to the community at large.

Your Chairman of 1910, Dr. Jackson, has called attention to the necessity for compulsory labeling of poisons sold by grocers. There are many preparations of caustic alkali that have been accidentally taken by children, and many hundred cases of cicatricial esophagial stenosis must have occurred through laxity in making and enforcing laws regulating the sale of poisons. Our delegate should be instructed to investigate this matter and present another resolution on this subject to the House of Delegates if necessary.

The problem of noise and its deleterious effects on the auditory nerve, and the effect of dust on the upper air-tract can be modified by passage and enforcement of sane laws.

We should join heartily in the propaganda for medical and popular education and form a society of human animal welfare that will take precedence over that organized for the dog and the automobile. When the science of prevention fully arrives, every human machine will be examined semiannually and a careful record kept in card index form about every organ in the body including the nose, throat and ear.

The greatest sign of the times that operates for the prevention of disease is the gradual elimination of medical sects and the elevating of medical educational standards. The osteopathic, botano-eclectic or homeopathic otolaryngologist has been relegated to otolaryngologic Pompeii and is now metamorphosed into a broad, liberal-minded nose, throat and ear surgeon who can think as a pathologist, internist or therapeutist as the occasion requires.

It is a well-known fact that abuses to the metabolic functions, though expressed in the apparatus under our special observation, will affect others through the medium of the connecting branches of the sympathetic system. The neuroses, psychoses and other disturbances of the ductless glands and vasomotor system may be prevented only by the proper hereditary development of a stable vasomotor system with stable ductless glands. Proper environment, education, control of the nervous system and good immunity must be added factors.

The practical application of the laws of prevention concern us in a small measure at present as compared with the otolaryngologist of future decades. As infection is the all-important etiologic factor of acute and chronic pathologic change in the structures under consideration, the prevention of disease becomes a problem of great individual scientific interest in quarantine, sanitation, hygiene, immunity, heredity and sociology.

Can we prevent deafness, hypertrophic rhinitis, pathologic tonsils, adenoids or accessory sinus disease? How much are we interested in the study of insect carriers? Do we realize that the house-fly can carry active tuberculosis germs from the sputum and deposit active tuberculosis germs on our food? Are

* Chairman's address, read before the Section on Laryngology, Otology and Rhinology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, June, 1914.

we keenly alert to the possible dangers to our community of the suppurating ear of the ex-scarlet fever patient, or from the throat or ear of the diphtheria carrier? Do we take cultures from acute infections?

The prevention of disease of the accessory sinuses has become more difficult by the laws of evolution that made the postural change in man from a quadruped to a biped. Many unchangeable, etiologic factors of prenatal or postnatal structural origin make prevention difficult. Anthropology tells us that the modern Caucasian bears many marks of asymmetry or abnormal development that attend our higher civilization and departures from aboriginal conditions.

The medical inspection of schoolchildren has given the otolaryngologist a splendid field of statistical study and observation along the lines of prophylaxis. It would seem that the scientific fruit of this labor should be forthcoming in some future program.

What methods or theories have we evolved that will lessen the enormous number of pathologic tonsils and adenoids? We know that the nasopharynx and nasal passages, in infancy and childhood particularly, are the seat of constant histologic change. Under degenerative laws of disuse such as the olfactory sense, atypical structural integrity and lowered heredity and physical and moral standards, a direct tendency to pathologic change is encouraged. It is asserted by radicals, therefore, that as the adenoid is a menace and the gateway of infection, preventive measures demand in every case a thorough prophylactic operation in infancy. This ultraradicalism may be progressive and justifiable in the future, but watchful waiting in the absence of symptoms seems a more reasonable policy in the light of our present knowledge.

The faucial tonsil as an embryologic remnant deserves further research. Its function remains in the realm of speculation and theory and the immediate and remote effects of its infection are thoroughly and generally realized, yet the wanton destruction of any structure will bring a reaction. We must, therefore, temper our procedure with judgment and skill, and operate under the rules that we would apply to our own flesh and blood.

When devotion to medical research and education in our particular realm shall unravel the mysteries of infection and the artificial and biochemical production of immunity, when the internal secretions may be regulated at the will of the therapeutist, the otolaryngologist will assume his greater rôle in the broad field of endeavor of preventive medicine and therapeutics. Major nose, throat and ear surgery will remain exclusively for the man of surgical mind, training and ability.

As the millenium has not arrived we must work on in our field of special choice under the optimistic banner, "We will do the best we can."

32 Adams Avenue.

The Creative Mind.—It is in the putting forth of the hypothesis that the true man of science shows the creative power which makes him and the poets brothers. His must be a sensitive soul, ready to vibrate to Nature's touches. Before the dull eye of the ordinary mind facts pass one after the other in long procession, but pass without effect, awakening nothing. In the eye of the man of genius, be he poet or man of science, the same facts light up an illumination, in the one of beauty, in the other of truth; each possesses a responsive imagination. Such had Bernard, and the responses which in his youth found expression in verses, in his maturer and trained mind took the form of scientific hypothesis.—Foster.

ACUTE INSULAR SCLEROSIS AND ITS CONCOMITANT VISUAL DISTURBANCES *

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Man does not live by bread alone, but also by catchwords: and, too often, faulty diagnoses come through the attempt to apply to many types of the same disease a hide-bound ritual, a uniform formulary, a triad or pentad of mechanical tests laid down in text-book after text-book as "classical" and thereby conclusive. Of no abnormal state can these strictures be more properly made than of the familiar and obscure entity introduced to the world by Charcot as *sclérose en plaque*.

The clinical picture of this condition with which the printed word has made us familiar is that of a chronic disease characterized by a spastic paraplegia, nystagmus, so-called scanning speech and intention tremor—which latter, by the way, is no tremor in any sense of the word but is rather a true motor ataxia of purely cerebellar origin. Such are the requirements demanded of the disease by undergraduates and the majority of practitioners; the dogmatic authorities often fail to point out the essential fact that these symptoms are in no way necessary for diagnosis, that they occur only in a certain number of cases and, usually, in these at but a very advanced stage, and that they are mainly dependent for their production on a disturbance of the ponto-cerebellar fibers—a more or less casual occurrence.

The diagnosis should depend on a consideration of the age of the patient, on the history of the disease, and on the grouping of the symptoms rather than on the presence or absence of individual abnormalities of function. These are probably the result of transient edematous phenomena occurring irregularly throughout the central nervous system.

The vagueness of many pathologic terms is studied and is necessitated by our ignorance of the precise processes on which depend the early symptomatology of this disease.

The sclerosed tissue is invariably in the immediate neighborhood of blood-vessels, and the first step in the morbid process is apparently a flooding of the nerve-cells and fibers with fluid exudate, the vessel wall having been weakened and rendered permeable by the agency of a toxin or virus as yet unknown. Only by the hypothesis that such an edema exists can we explain the rushing onset and the rapid remissions and recoveries of some of these cases. The occurrence of such processes can only be assumed, in that post-mortem examinations are possible in the majority of instances only after the disease has long become chronic.

The scattered islets of hypertrophic glia are of doubtful causation; and no exact proof is forthcoming as to whether they are the expression of a primarily parenchymatous disease or of an inflammatory process affecting in the main the interstitial tissue. The clinical course of the disease as exhibited by its remissions and intermissions, its transient amblyopias, transient paralyses and transient attacks of subjective sensory manifestations occurring in its incipiency,

* Read before the Section on Nervous and Mental Diseases at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

would point to an affection of the interstitial elements rather than to one of the parenchyma proper. A primary degeneration of the latter would be inexplicable in view of the frequent rapid cessation in progress and not rarely utter disappearance of symptoms of the greatest severity.

The hypothesis of an interstitial inflammation set alight by a toxin emanating from the blood or lymph-stream and giving rise to local edema exerting mechanical pressure on the contiguous nerve-fibers, is required if we would properly interpret the phenomena of the disease and intelligently explain in particular those more acute types of which this paper particularly treats.

In two of my cases edemas especially affected the medulla, giving rise to a series of paralyses of cranial nerve nuclei, a picture rather resembling a basal meningitic condition. In two there was acute inflammation of the optic papillae; in the third were seen unequivocal signs of an antecedent retrobulbar neuritis, ocular phenomena sufficiently important to merit here some detailed discussion as to their significance.

The most frequent prodromal symptom of an incipient sclerotic change throughout the central nervous system is some transient disturbance of the function of vision. Broadly speaking, this may be of two kinds: first, a passing attack of diplopia due to a sudden edematous change usually in the neighborhood of the oculomotor nuclei; second, a mistiness or blurring of vision rarely bilateral and of a duration varying from a matter of seconds to, in infrequent instances, some thirty-six or forty-eight hours.

The optic nerve, being in direct continuity with the central nervous system, is vulnerable in proportion to the delicacy of its physiologic functions and anatomic structure, by the morbid states affecting both the central and peripheral nervous systems. Not only is it vulnerable in proportion to its delicacy, but the same statement applies to its constituent parts, for we find that failure of visual acuity first takes place in those parts of the fields subserved by the most highly specialized groups of fibers in the trunk—the macular bundles—with the result that visual failure, in almost all cases of retrobulbar neuritis, takes the form of a central or paracentral scotoma. When such a gap occurs in the field of vision, it is present at first only as a localized disturbance of the color sense, which however quickly becomes a loss of perception of form as well.

It is during the formation of such scotomata that the patient complains that objects are seen as through a mist or film, and that, when reading, the letters often seem at times to run together—symptoms doubtless explained by unequal functionating power in contiguous optic nerve-fibers resulting in unequal and confused perceptions. That insular sclerosis has a toxic origin is a hypothesis already put forward in this paper, and the likelihood of its truth is enhanced when we correlate the reactions of the optic nerve to poisons like wood alcohol and excessive tobacco with those found in the same structures in the course of disseminated sclerosis. It has been said above that fleeting attacks of intensely acute diplopia also constitute one of the earliest manifestations of the onset of this disease. Dependent on such diplopias frequently occur acute vertiginous seizures. Diplopia is the result of a sudden loss of parallelism in the axes of the eyeballs, the result of rapid weakening of one or more ocular muscles, with consequent overaction of the intact antagonists.

This loss of axial parallelism in extreme degree constitutes paralytic squint, a rare occurrence in multiple sclerosis in any but the most fulminating cases. In short, it may be said that the acuteness of the diplopia and the resultant vertigo is inversely as the degree of ocular axial divergence and ocular muscle weakness. This apparent paradox becomes clear when we remember the varying degrees of sensitiveness present in the different areas of the retina—the maculae being alone capable of receiving and transmitting acutely defined images, the paramacular areas being slightly less efficient, while images received by the retinal periphery are highly nebulous and vague.

When normal binocular parallelism obtains, images of an object directly looked at fall on the two maculae; when one eye is rotated inward—for example through an external rectus palsy — the image in that eye is received on the retinal margin and, being hazy, is readily ignored by the patient's consciousness, but if the palsy be so slight as to be objectively invisible, the image in the affected eye will fall just beside the macula, and will be so clearly cut as to defy suppression by the higher centers. A diplopia of distressing intensity accompanied by acute vertigo and physical disorientation will then have resulted in the earliest stages of multiple sclerosis and without apparently adequate cause.

Case 1.—W. H., man, aged 23, was admitted to the National Hospital for the Paralyzed and the Epileptic under the care of Dr. Gordon Holmes on April 21, 1909. His father had lately become insane; no other neuropathic family history. Married three years; one healthy child. Venereal disease and risk denied. Teetotaler. Ten cigarettes a day. Previous history good.

Present Illness.—In the third week of February, 1909, patient began to have difficulty in walking; he became rapidly worse, acutely dizzy—used to fall about as though drunk, direction inconstant. In his frequent attacks of vertigo he experienced no definite direction of the rotation of external objects; "everything was hazy and blurred." There were frequent acute attacks of diplopia. A week after onset had occasional retention of urine and some precipitant micturition. At the end of March dimness of vision began in the left eye and was steadily progressive. Five days before admission to hospital dimness of vision in the right eye began and progressed so rapidly that on April 21 the vision in that eye was less than that in the eye first involved. In this same period patient began to have weakness in his right arm and his right leg, of extremely rapid progression, so that when first seen he had but little movement in either limb. For some days before admission the toes of both feet felt dead "as though frost-bitten." Transient, acute diplopia accompanied by equally acute vertigo from hour to hour; some nausea and vomiting.

Examination.—The patient looked thin and weak. He was unable with the right eye to see a moving light. With the left eye the candle could be seen in the periphery of the field, but not at all in its center. The optic disks: right: edges blurred, except for a small portion equal to about a fifth of the circumference of the disk at the outer margin. The veins and arteries showed little change in caliber. Edematous appearance spreading to the retina from the disk at upper inner and especially lower margins. Vessels at inner part slightly buried. The fundus most easily seen with a plus 2 D., the disk with a plus 5 D. lens. Left: disk rather pale, vessels normal, retina seen with plus 2 D.; no swelling. Coarse nystagmus present on looking to the right and to the left. Difficulty in looking to the left. Weakness of left sixth nerve. Pupils equal, brisk to light, but immediately redilate despite maintained illumination. Weakness of

the left side of the face of nuclear type. Remaining cranial nerves: normal. Motor system: upper extremity: All movements present on the right side, but of enormously reduced power. On the left side, power fair, but reduced. No ataxia or tremor. No spasticity, but on the contrary much loss of muscular tone on both sides. Lower extremity: Right limb flaccid and very weak. Capable of being only slightly moved at each joint. No wasting. All movements of fair power on the left side. No gross sensory loss present. Reflexes: Upper extremity: Difficult to elicit, those on the left less than those on the right. Abdominal reflexes not lost, but reduced, the right being less than the left. Right knee-jerk sluggish; depressed but more brisk on the left side. Slight ill-sustained left ankle clonus. Plantars both of extensor type. No sphincter trouble. Patient unable to stand on account of both weakness and vertigo.

Course.—April 25: Much vomiting and nausea.

April 29: Power in the right arm very greatly improved. Incontinence of urine to-day.

May 1: Power is very considerable in the right arm, but the right grasp is almost nil. Likewise the power around the great joints in the right leg has returned, but patient is incapable of movement of the right toes. No paresthesias. Vision improving. Perception of light in the right eye; with the left he can now count fingers in the peripheral field.

May 2: General health as yesterday, but the right arm and leg are much worse. Movement at the right elbow abolished. Abduction at the right shoulder just possible of initiation. Movement in the right lower extremity this morning is abolished.

May 6: Some vomiting. Pupils as before. Left external rectus movement restored. Nystagmus present in all directions. Left facial weakness as before. Palate moves well on phonation, but the palatal reflex cannot be obtained, although the palate itself is not anesthetic. Upper extremity: movements at right shoulder and elbow have returned. Some spasticity now present in the right arm. Left arm movement good. All movements are present in the right leg, though they are much weakened. Left leg: good. Reflexes: Right upper extremity not obtained. Left upper extremity brisk. Abdominal reflexes absent on both sides. Knee-jerks: right, reduced. Left, fair. Ankle-jerks: right, absent; left, fair. Double extensor response. No anesthesia or analgesia. Joint and muscle-pain sense normal. No loss of appreciation of temperature.

May 10: Occasional nausea and weak vomiting, much hiccough. Diaphragm acts quite well. Pulse 61 per minute. Left sixth and seventh nerves to-day are both markedly involved.

The slowing of the pulse, the appearance of nausea and vomiting and the attacks of hiccoughing point to an involvement of the bulb which at this date gave us reason to suspect impending trouble. Paralysis of the sixth and seventh nerves, which had from the beginning been present, but fluctuant, became now almost complete: evidence of pontine involvement which was unmistakable.

May 14: Hiccoughing almost continuous. Patient has become emotionally unstable. Expresses all feelings by immoderate laughter. Speech has become scanning, ataxic and explosive.

May 18: General condition much worse. Right leg felt heavy on awakening this morning. Right arm as before. Articulation worse. Pulse 55. Nystagmus in all directions. Conjugate upward movement of the eyeball much limited as is also conjugate movement to the left.

According to the pathologic processes assumed at the beginning of this paper, the edema which for some weeks had been appearing locally at scattered points in the brain stem was now involving the region of the corpora quadragemina, with the result that the ocular conjugate movements were being seriously interfered with.

Vision: Counts fingers at 3 feet with the left eye. With the right, can distinguish a lamp if held in the peripheral field. Complete peripheral paralysis of the left side of the face. Palatal reflex abolished. Palatal sensation good. Right upper extremity almost completely paralyzed; spastic. Left upper extremity normal. Right lower extremity very weak; not spastic; tone poor. No deep reflexes obtained on the right side. Right abdominal reflex obtained; left absent. Plantar reflexes as before.

Sensation: Cotton touches everywhere felt. Pin-prick is felt as touch over the surface of the left foot and on the posterior and inner surface of the left leg. Temperature sense normal. Deep muscle-pain sense acute.

Sense of Position: No mistakes on the left side. Complete loss in the right fingers and in the right wrist. If the patient closes his eyes he is unable to point to his right hand with his left. He is unable to say where his right hand may be. Complete astereognosis in both hands.

May 20: Vomiting. Nasal quality of speech increased. Urgency and precipitancy of micturition.

May 25: The taking of the visual fields this morning by means of Bardsley's scotometer caused distress and vomiting. Conjugate movements of the eyes either to the right or left side are to-day absent. Downward movements fair and upward conjugate movements have improved and are accompanied by jelly-like nystagmus. Much difficulty in swallowing this morning. Right upper extremity: All movements at elbow, wrist, and finger-joints can be performed, though weakly. Right lower extremity weak. The muscles of the right arm and leg are flabby and toneless, but spasticity is felt when passive movements are carried out at the joints.

Sensation: Complete loss of sense of position in the right upper extremity and in the left foot and ankle. Deep muscle pain sense diminished in the left leg.

Reflexes: Upper extremity: reflexes present on the right. Abdominal reflexes absent. Knee-jerks and ankle-jerks exaggerated on both sides. Double ankle-clonus and double extensor plantar response.

May 24: Last night patient was incontinent of urine. Since then has dribbled continuously. He says he feels the water passing, but has no control over it. No rectal trouble.

May 30: Numbness and tingling felt in the left arm and hand. Flexion and extension very weak at the left wrist. Finger movements present, but feeble. All movement abolished at the left shoulder-joint. Marked weakness of all movements of the left leg. It is to be noticed that on the day preceding the involvement of the limbs of the left side, the left arm and leg were in good motor condition.

June 1: Condition much worse. Complete paralysis of all movements of the left arm and hand. At the right elbow slight power of flexion and extension still remains. The legs are completely paralyzed. The arm and the leg on the right side are spastic; those on the left flaccid.

Sensation: Complete loss of sense of position in the left arm and almost complete loss in the left leg. No loss to pin-prick. Complete loss to cotton touch in the left arm.

Reflexes: Right arm: reflexes present; left arm, absent. All abdominal reflexes present. Knee-jerks depressed, especially on the left side. Ill-sustained ankle-clonus on both sides. Double extensor response.

Complete paralysis of both the bladder and rectal sphincters.

There is no power of conjugate movement of the eyeballs either to the right or the left side. Upward movement almost nil. Downward movement also reduced in range. Nystagmus in direction of movement. Palate immobile. Voice almost unintelligible.

Electrical reactions: The muscles of the face, the anterior abdominal wall, and all four limbs tested with faradism and galvanism. All react overbriskly (a current incapable of producing contractions of my interosseal hand muscles caused wide-spread contractions in those of the patient and also in muscles considerably removed from the point of application). A strong faradic current barely felt anywhere except on the temples.

June 3: All movements to-day can be feebly performed by the hands, wrists, and elbows of both sides. Slight abduction possible at both shoulders. Retention of urine.

June 6: Power improving in all four limbs. Incontinent bladder and rectum. Pupils to-day are equal and have brisk reactions which are no longer of retrobulbic type. Conjugate

movement of the eyeballs has reappeared and is rapidly improving in all directions. It is accompanied by gross nystagmoid jerking. All movements are present in both the upper and lower limbs; those on the left side are stronger than those on the right. Gross loss of sense of position in all four limbs. No other sensory change.

June 11: Rapidly improving.

July 3: Pupils normal. Conjugate movement of eyeballs almost complete. Convergence impossible. Palatal reflex normal. Markedly emotional. All movements are present in all four limbs which are, however, both spastic and ataxic. Sense of position absent in upper, and impaired in lower extremities. Reflexes as before.

August 25: Improving daily. Diplopia is now present in distant vision, consequent on marked return of visual acuity. Speech scanning, syllabic, and explosive. Emotional. Ataxia in all four limbs but more marked on the left than on the right side. To-day attempted to stand. Astereognosis in both hands. Sense of position absent in the right wrist and fingers; also in fingers of the left hand. Reflexes as before. No rectal incontinence now. Is incontinent of urine about once a week.

September 28: Improving daily. Walks the length of the ward without help. Very slightly ataxic. Sphincters normal. Beyond changes in the optic disk there is now no trace of any previous involvement of the cranial nerves.

I have purposely omitted detailed mention of the behavior of the optic nerves and the consequent fluctuations in visual acuity. In such a cloud of symptoms as was shown by this patient it would be difficult closely to follow the various changes found in the optic disks; for this reason they will now be described separately.

On admission, as has been said before, patient was unable with the right eye to see a moving light. With the left eye the candle could be seen in the periphery of the field. Optic disks: Right: doubtful blurring of the inner edge. Vessels normal. Left: a rather dead-looking pallor in the outer temporal quadrants.

May 3: Right: veins considerably distended. All edges are blurred with the exception of that on the outer side. Color normal. The pit is naturally somewhat small—there is some whitish tissue in it which is possibly developmental. Hypermetropia plus 2 D. Disk seen with plus 3 D. Left optic disk as before.

It is to be remembered here that five weeks previous to this examination there was almost complete loss of vision in the left eye, a condition now rapidly developing in the right eye as well.

It is to be presumed that an ophthalmoscopic examination of the left disk carried out at the end of February would have revealed a venous distention and a blurring of the disk edges similar to the phenomena seen in the right eye in May. The condition seen in the left disk was a result of a previous inflammatory state which later occurred in the right optic nerve as well. Two types of congestive phenomena may occur in the optic nerve—the papillo-edema consequent on increased intracranial pressure, and that known as retrobulbar neuritis.

The first is a purely mechanical condition, in which cerebrospinal fluid is forced from the main reservoir of the ventricles and the intradural space down the vaginal sheaths to appear at the point of lowest resistance — the nerve-head, whence it is drained into the sclera at a rate which varies with the type of formation of the eyeball—more rapidly and more effectively in myopic than in hypermetropic eyes. The second condition, however, has to do, not with the water-jacket of the optic nerve, but with the fibers themselves. As indicated by its name, the morbid process takes place posterior to the globe, is a true inflammation, and its occurrence is accompanied from the beginning by rapid loss of function in the affected fibers which lie in the bony walls of the optic canal. This loss in visual acuity is produced at first by the deterioration in the macular bundle which has as its consequence a central scotoma. Owing to the rigidity of the environment of the nerves, a degree of pressure will be produced which will quickly interfere with function; and, for the same reason, the degree of fluid transudation in the nerve-head will be less than is found in the mechanical abnormality first mentioned. In the latter, loss of visual function occurs but late in the disease and takes the form of a gradually increasing concentric contraction in the fields due to an organization of the edema into connective tissue. It follows, therefore, that as, in the case of retrobulbar neuritis, fiber constriction is produced by fluid exudate, and, in pressure papillo-edema, by solid connective tissue, the chances of recovery from blindness due to the former are much superior to those from blindness due to the latter.

This power of recovery, after the total destruction of vision, was admirably shown in the case under consideration, and it may here be said that permanent loss of sight practically never occurs as a result of insular sclerosis, however acute may be the initial seizure.

May 7: All the edges of the right disk were blurred except a small portion at the outer margin equal to a fifth of the total circumference of the disk. The veins and arteries showed little change in caliber. Swelling has increased by plus 2 D. An edematous appearance is seen spreading to the retina from the disk at the upper, inner, and especially the lower margins. Inner vessels slightly buried. Left optic disk: pale and unswollen.

Three days later: Right: whiter in temporal quadrants, outer edge fairly clear, vessels very small. Left disk as before.

May 17: Right: Swelling reduced by 2 diopters. Color pale. Left as before. Patient can count fingers at a distance of 3 feet with the left eye, but with the right can only distinguish an electric lamp if it be held in the periphery of the field.

May 28: Right: edges visible, blurring only in the upper and inner margins. Swelling almost gone. Color pale. Arteries very small.

June 7: Right: disk clear-cut with the exception of a woolly patch on the inferior temporal edge.

July 23: Both disks pale. Can count fingers on both sides.

August 25: Visual acuity: Right 6/30, left 6/20.

September 28: Right 6/12, left 6/12.

CASE 2.—My second case is that of a Russian Jewess, aged 26, whom I saw in consultation with Dr. Frederick Peterson and Dr. Held, in the latter part of February, 1912. She had been married five years and had two healthy children. No history of lues. The Wassermann test in the blood-serum was twice found to be negative.

Present Illness.—Previous to May, 1911, her health had always been perfect. In that month, after a steam bath, she noticed that her legs were weak; they both felt numb. These symptoms appeared rapidly—within half an hour they assumed definiteness—and progressed in severity for two days, during which time she was also dizzy and complained of much blurring of vision in both eyes, with occasional diplopia. This entire attack lasted two weeks, by the end of which all trace of ailment had quite disappeared, so that she was thought by many to have gone through a hysterical seizure. Her recovery was such as to allow her to take up with much vigor the management of her shop, on which for four months she expended much physical and mental work. Again she had a sudden attack of blurred vision, which ended in complete loss of sight for two or three days' time. No sooner had partial vision been restored than she noticed in the glass

one morning that the right side of her face was flattened and immobile and that she could no longer wink with the right eye. In other words, she had developed a complete right facial palsy of peripheral type. On the day of this observation she again had diplopia, the cause for which was seen on the same evening in a marked weakness of her right external rectus muscle. This situation was not maintained for long; her diplopia was replaced by another fleeting attack of blindness, during which she began to complain of numbness in the fingers of the left hand, which was in turn quickly followed by weakness and unsteadiness in both the extremities of the left side. This left-sided hemiplegia did not improve; it became more severe. Much diplopia and vertigo and frequent paresthesias in the fingers and toes of both sides were present, choking attacks made their appearance in January, 1912; in these respiration became slow and sighing, and the pulse dropped to between 45 and 50 a minute.

Examination.—The ocular fundi showed well-marked pallor in the temporal quadrants of both papillae—clear proof of the retrobulbar origin of the attacks of blindness. The physiologic pits were not filled in, nor was there any evidence of disturbance of retinal pigment. The pupils reacted briskly to light and on convergence but had poor muscular tonus. The right external rectus and the right side of the face were almost completely paralyzed. The left fifth nerve was affected, as shown by a deviation of the lower jaw to the left side on opening the mouth, and by a poor contraction of the left masseter as compared with its fellow on the right side. The soft palate was immobile; its reflex was absent but its sensitiveness was retained. The voice was very weak and was nasal in quality. There were regurgitations of fluid through the nose. Almost complete spastic paralysis of the left arm and leg. The right foot was dropped, owing to a flaccid palsy of the anterior tibial muscles. Patient was completely incontinent of both urine and feces. No sensory change could be made out, but this was perhaps owing to the impossibility of obtaining the patient's cooperation.

Course.—She succumbed to respiratory failure—a typical medullary death. Permission for necropsy was not obtained.

In this case the early symptoms pointed unmistakably to the pons as the main seat of the trouble; the possibility was considered of its nature being neoplastic rather than edematous and sclerotic, but that alternative was negatived by the ocular symptoms and especially by the ophthalmoscopic findings. The symptomatology was parallel with that in the first case and the issue would most probably have been similar had not the acuteness of the condition discounted the woman's resistance. To these two cases may be added a short account of a case that I saw in the service of Sir William Gowers.

CASE 3.—A man, aged 22, Aug. 16, 1909, had diplopia, vertigo and dimness of vision in both eyes, which was progressive, so that on August 24 he could distinguish form only in the periphery of both visual fields. The pupils had marked retrobulbar reactions. Optic disks showed a low-grade swelling on both sides.

August 27: Pupillary reactions poorer and some limitation of conjugate ocular movement upward.

September 1: The light reflex, from being almost imperceptible, is now fair. Ocular movements almost normal again. Vision worse; patient now only able to perceive peripherally placed lights.

September 9: Patient can again recognize physician's hand.

September 24: Patient is able to count fingers at 3 feet distance with each eye; central scotomas maintained.

October 4: Numbness in the left leg; left-sided ankle-clonus and left extensor plantar response. Optic disks, pale in outer quadrants. No swelling.

October 6: Retention of urine. Numbness in right hand.

October 11: Rapid onset of spasticity in both lower extremities.

October 13: Complete bladder and rectal incontinence. Vision: Right, 1/36; left, 1/60.

October 14: Numbness in both hands.

November: Weakness in right arm. Central scotoma in each eye. Complete paraplegia with sphincter palsy.

Repeated examinations of the cerebrospinal fluid failed to show any abnormality. This with a negative history served to exclude cerebrospinal lues.

In all these cases there were marked fluctuations in the severity of the symptoms; in none could the clinical picture be said to correspond with the textbook descriptions of the disease; but the symptom grouping and the variability of progress in each case left no room for doubt as to the correctness of the diagnoses.

20 West Fiftieth Street.

ABSTRACT OF DISCUSSION

DR. GEORGE A. MOLEEN, Denver: It is to be noted that the cases reported by Dr. Kennedy were drawn from the country in which multiple sclerosis is most frequent. Our German friends would have us believe that many of these cases are really cases of syringomyelia and are not seen in this country so frequently. We generally hold that with such degenerative processes as multiple sclerosis characterizes we find retrobulbar atrophy more frequently. I am glad to hear suggested an explanation of the papilledema, even a primary hyperemia or a primary sero-edema, however localized. The majority of cases of multiple sclerosis which one sees here shows limited fundus changes, and yet I do not believe that they are searched for with the care which their importance demands. I do not believe I have ever seen a case of edema in multiple sclerosis. Dr. Prentiss and I, in the National Hospital, discussed the question whether it was the rule to find edematous changes in the papilla in association with diseases of a purely degenerative character with a generally negative inclination. Dr. Kennedy's findings are interesting if based only on clinical evidence. As I understand it, there was no necropsy in these cases. It would be very interesting to know, as a departure from the idols which we hold with regard to degenerative diseases, whether or not there was, in association with those symptoms, a possible neoplasm, or at least something which we believe to be at the basis of most conditions of papilledema, that is, increase of intracranial pressure.

DR. PETER BASSOE, Chicago: Will Dr. Kennedy state the frequency with which optic neuritis occurs in the early stages of disseminated sclerosis? I am inclined to think that there is a stage of optic neuritis in many of these cases before the familiar pallor of the disks sets in. I recall a case of a young woman with no physical signs of organic disease who suddenly became blind in one eye. There was a distinct hyperemia of the disk, but an able ophthalmologist stated that it was not necessarily beyond physiologic limits. The patient was treated for hysteric blindness and recovered her sight, but a year or so later she developed the ordinary signs of disseminated sclerosis. In another case which I examined only post mortem I found typical lesions of disseminated sclerosis including marked changes in the optic chiasm and optic nerves. There was a history that an ophthalmologist had found a choked disk at a very early stage.

DR. WILLIAM W. GRAVES, St. Louis: Has Dr. Kennedy in his recent study of the literature found many cases of multiple sclerosis in which the optic nerves were involved to the extent of complete atrophy?

DR. FOSTER KENNEDY, New York: Dr. Moleen suggests that these cases might possibly be neoplastic. This possibility, as indicated in the paper, was considered at the time. In Case 1 the patient went through a series of events which came out extraordinarily quickly, each phenomenon appearing in a way that is not usual in neoplasms. Further, his recovery from all those acute symptoms was almost complete. From being in a state practically dead, he recovered to a

very considerable degree of efficiency. The fact that he lived and that his symptoms disappeared, would seem to do away with the possibility of neoplasm. The patient in Case 2 died. The only direct evidence we had that this was not neoplasm of the pons was the fact that the woman had very marked pallor in each disk; a retrobulbar condition which could not be explained by a pontine tumor. In Case 3 the man's symptoms began as a retrobulbar neuritis with scotomas, progressed to bilateral paresthesia in the hands and ended with a well-marked middorsal lesion in the spine. Dr. Bassoe asked concerning the frequency of optic neuritis in sclerosis. At some stage of the process, retrobulbar neurtis has been present in most cases to some degree; but practically every case of advanced disseminated sclerosis shows a varying degree of pallor of the disks. That can only be brought about by degeneration of the macular bundle, and that degeneration is produced by an area of edema in the course of the optic nerve. This is true optic neuritis, and while Uhtoff says that 50 per cent. of the cases of disseminated sclerosis show optic neuritis, I wonder if he does not mean that in half of the cases of disseminated sclerosis is found temporal papillary pallor. Answering Dr. Graves' question as to the production of permanent blindness in disseminated sclerosis, owing to lack of time I was silent on that question. I state in the paper, however, that the first patient's visual progress, his complete blindness and the recovery of his sight afterward to a very considerable degree, is only a quantitative variation of the progress that I am accustomed to look for in severe cases of this disease. I think one may lay it down as a fact that permanent bilateral blindness does not occur as a result of disseminated sclerosis.

DIFFERENTIAL DIAGNOSIS OF NEPHROLITHIASIS AND RENAL TUBERCULOSIS BY ROENTGENOGRAPHY*

MARTIN KROTOSZYNER, M.D.
SAN FRANCISCO

The differential diagnosis of renal tuberculosis and lithiasis is, at present, in the great majority of cases easily accomplished by the trained urologist. The positive evidence obtained from a good roentgenogram establishes at once the diagnosis of calculus, and if in a cachectic individual with suspicious lung-symptoms a protracted and distressing pyuria exists, the diagnosis of renal tuberculosis can be ventured, though tubercle bacilli may not be traceable in the bladder-urine. Thus a correct recognition of both pathologic conditions is, in many instances, feasible by the general practitioner who has taken the pains to familiarize himself with the routine technic of modern urologic diagnostic methods.

Roentgenography is at present justly recognized as the most important means of diagnosing renal calculus, and a satisfactory kidney-plate demonstrating one or more characteristic calculus shadows is now, especially since the more general use of the compression diaphragm, feasible even at the hands of the country practitioner. The risk, besides that, of overlooking or not recognizing concrement shadows can be considerably reduced by the repeated roentgenographic examination of patients with suspicious symptoms of the upper urinary tract.

It is, therefore not surprising that indications for operative procedures in alleged renal lithiasis are, in many quarters, based solely on positive plate-findings. That this must often lead to disappointment and failure is apparent from the fact that, according to a recent review on the value of roentgenography for the diagnosis of urologic lesions, from Immelmann's laboratory[1] thirty-two possibilities of erroneous plate interpretation exist, by which the roentgenographic stone diagnosis is rendered unsafe at the hands of the uncritical and inexperienced observer.

PREVIOUS LITERATURE

While thus the diagnostic importance of roentgenography seems to be over-estimated as regards nephrolithiasis, its value for the recognition of renal tuberculosis, in the absence of clinical or laboratory evidence, is not yet sufficiently appreciated. The literature contains but scant data on the Roentgen diagnosis of tuberculous kidney conditions. Casper[2] and Forsell[3] were able to recognize on the plate tuberculous parenchymatous changes (cavities); a mottled appearance of the kidney shadow is according to Hoffmann[4] and Holland,[5] characteristic of tuberculosis, and irregularities in the density and contours of the kidney shadow are considered by Cole[6] as well as by Proust and Infroid[7] as significant of inflammatory tuberculous foci. An abnormally large kidney shadow may, according to Arthur Hoffmann[8] be characteristic of tuberculosis. More important, because of definitely practical value, is the Roentgen diagnosis of calcified tuberculous foci within the renal shadow. These calcifications, the smallest of which may cast perceptible shadows on the plate, are, according to Burchard,[9] generally located in the lateral portions of the kidney and have only rarely been found in the region of the pelvis or calices. By their location on the plate as well as by their indefinite contours they can, as pointed out by the same author in his exhaustive review on this subject, readily be differentiated from calculus-shadows. Von Lichtenberg and Dietlen[10] consider pyelography of definite value in the local diagnosis of renal tuberculosis as permitting of an exact anatomic orientation on the character and extension of the destructive process of renal parenchyma. An important contribution to the Roentgen diagnosis of renal tuberculosis was lately presented by Söderlund,[11] who reports three cases with characteristic plate-findings, from which alone he was able to make a correct local diagnosis which was afterward verified at the operation.

TUBERCULOUS PUTTY-KIDNEY

A critical review of the literature concerning the plate diagnosis of renal tuberculosis forces on us the conclusion that its real and practical value lies in its differential diagnostic aspect with regard to nephrolithiasis. The importance of a correct differential diagnosis is the more obvious since, not infrequently, the other clinical methods of examination either cannot be applied or fail to yield diagnostic evidence. In these cases plate-findings may be of the utmost diagnostic importance as the only means of disclosing the seat, extension and character of the

* Read before the Section on Genito-Urinary Diseases at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

1. Rubaschow, S.: Ztschr. f. urolog. Chir., 1913, p. 465.
2. Casper: Wien. med. Wchnschr., 1911, No. 37.
3. Forsell: Fortschr. a. d. Geb. d. Roentgenstrahl, xiii, 51.
4. Hoffmann: Zentralbl. f. Roentgenstrahl., 1911, Nos. 1 and 2.
5. Holland: Arch. Roentgen Ray, January, 1911.
6. Cole: New York Med. Jour., lxxxvii, 774.
7. Proust and Infroid: Paris Société anatomique, 1909.
8. Hoffmann, Arthur: Zentralbl. f. Chir., xxxvii, No. 51.
9. Burchard: Fortschr. a. d. Geb. d. Roentgenstrahl., xx, 281.
10. Von Lichtenberg and Dietlen: Mitt. a. d. Grenzgeb. d. Med. u. Chir., xxiii, No. 11.
11. Söderlund: Fol. Urolog., vii, 75.

lesion. As regards the roentgenographic differentiation of tuberculous calcifications from lithiasis, the partial or total so-called putty-kidney (*Kittniere* of the Germans) presents such definite and characteristic plate-features, that on its basis alone a correct diagnosis may be feasible. Through the kindness of Dr. H. M. Sherman of San Francisco, to whom I herewith wish to express my thanks, I am able to present a beautiful roentgenographic specimen of a total putty-kidney, which is the more instructive from a differential-diagnostic standpoint, since it combines the classical features of roentgenographic tuberculosis and lithiasis (Fig. 1).

The illustration represents the roentgenogram of the right kidney and ureter of a man of 38, who in 1907 came under Dr. Sherman's observation at St. Luke's Hospital, San Francis o, with a history of pyuria and frequent and painful micturition of twenty years' duration. A roentgenogram of the right kidney region demonstrated a huge shadow of unusually intense density and of the size and shape of an enlarged kidney shadow, and a less dense well-defined characteristic calculus shadow impacted in the ureter about 4 cm. below the upper shadow. The right kidney and upper part of the ureter was removed. The wound healed properly and the patient's symptoms gradually abated so that at his discharge from the hospital four months later, he was passing urine but seven or eight times in twenty-four hours. The removed kidney showed marked caseation. The ureteral calculus was 2 cm. long.

Fig. 1.—Tuberculous putty-kidney. Calculus in ureter at *A*.

I can find the record of only a few similar observations in the literature. The first case of a roentgenographically recognized partial putty-kidney was reported by Forsell and Josefsson[12] in 1908. Two years later Hürter[13] published the first plate of a total putty-kidney, in which the diagnosis of marked tuberculous calcifications of the right kidney and ureter was afterward verified at the post-mortem examination, when the parenchyma of the right kidney was found to be replaced by large cavities filled with cheesy material. Quite recently two cases of total putty-kidney in which the operative indications were based solely on roentgenographic findings afterward proved to be correct at the operation, were reported by Söderlund.[11]

The plate represented by Figure 1 permits of a correct diagnosis through the marked difference in density between the two shadows. The lower oblong, equally dense, and well-defined shadow is, obviously, the photograph of a calculus. The upper denser and, on account of its ragged edges, somewhat irregular shadow, shows an unequal intensity of density suggestive of being cast by disorganized and incrustated material and not by homogeneous concrement substance. The plate is, therefore, a unique specimen of total tuberculous putty-kidney, combining the skiagraphic features of tuberculosis and lithiasis and thus demonstrating, at a glance, the value of roentgenography for the differential diagnosis of both conditions.

12. Forsell and Josefsson: Hygiea, 1912.
13. Hürter: Ztschr. f. Roentgenkunde, 1910, No. 11.

SCATTERED CALCIFIED FOCI

While though, in this instance, the diagnosis could be fairly well read from the plate, there are cases recorded in the literature with shadows on the plate resembling concrement-shadows, the differentiation of which from tuberculosis, in the absence of other clinical and bacteriologic evidence, is either very difficult or actually impossible. Occasionally patients enter the hospital with symptoms pointing to lithiasis and demanding immediate action, where in the interpretation of shadows on the kidney-plate the possibility of an existing tuberculosis should always be borne in mind. The following observation will serve to illustrate the point:

In the earlier part of 1908 I was summoned to a man of 41, whom I found in deep uremic coma. Complete anuria; bladder empty; high temperature; rapid and compressible pulse, kidneys not palpable. No data on the previous history could be ascertained. A tentative diagnosis of calculous anuria was made which appeared to be obvious, when two concrement shadows were noticeable on the plate of the left kidney-region (Fig. 2).

The patient was rushed to the hospital where the left kidney, on exposure, was found to be considerably enlarged, containing a pus-cavity at its upper pole, while in the center of the organ two small cavities filled with cheesy material were found. The kidney was, therefore, removed. The patient died the next day without voiding urine or regaining consciousness. The right kidney was found, at the post-mortem examination, to be small, presenting the typical picture of tuberculous atrophy. Renal function, in all probability, had been maintained by the left kidney, the enlargement of which was, obviously, due to compensation.

While the diagnostic error in this case was excusable, on account of the absence of other clinical evidence, a critical perusal of the plate-findings, done with the caution, at present considered indispensable in the interpretation of concrement shadows, might have aroused doubts in the diagnosis. The striking difference in the density, the demarcation and shape of both shadows points to the existence of different shadow-casting substances, which is not characteristic of lithiasis. Particularly the dimness and spotted appearance of the lower shadow with its indefinite edges would to-day, in the hands of the experienced observer, lead to the rejection of the stone diagnosis.

It is very doubtful, however, whether the positive diagnosis of tuberculosis could be made on the basis

of these plate findings. The correct interpretation of suggestive concrement shadows is very difficult even in the presence of more or less characteristic features pointing to tuberculosis. When these are absent, though, the resemblance of tuberculous foci to calculi shadows is so striking that a correct plate diagnosis is well-nigh impossible, as in the following observation:

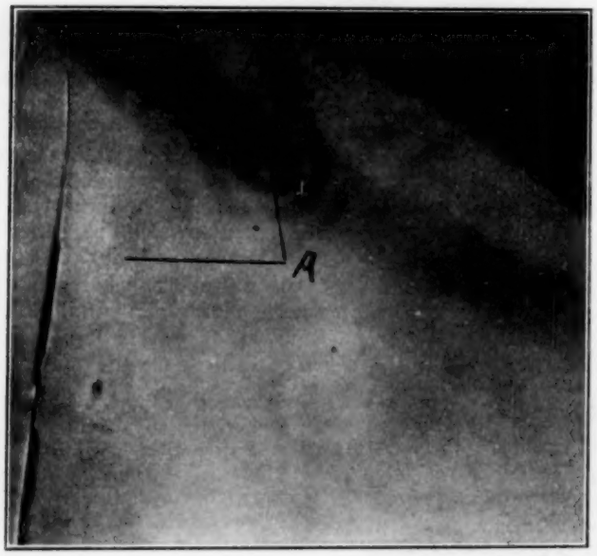

Fig. 2.—Calcified tuberculous foci at *A*.

A stout woman of 44, of excellent physique, had suffered for the last eighteen months from attacks of typical right-sided kidney colic and frequent and painful micturition. Repeated urinalyses demonstrated a moderate amount of pus and blood and no tubercle bacilli. At the hospital the physical examination, including kidney palpation, proved negative. Cystoscopy showed a perfectly normal bladder, except for a moderate cystitis coli, and no abnormality in appearance and spurt of either ureter. The urine of the right side was slightly cloudy and contained, microscopically, pus and blood in moderate amounts, while the secretion of the left kidney was normal in appearance and microscopically. The various functional tests showed good values on both sides, in fact a slight but uniform superiority of function of the suspected right kidney (sugar after phloridzin 1.2 on the right against 1.0 on the left side, etc.). No tubercle bacilli in right renal secretion. Repeated roentgenographic exposures including a pyelogram (Fig. 3) showed on the right side two small round and well-defined shadows, which were interpreted as calculus shadows.

The exposed right kidney presented, near its lower pole, two small cavities filled with a gritty, caseous material. The removed kidney showed, in the region of its pelvis, granulation and cicatricial tissue in which tubercle bacilli with giant-cells were present (chronic tuberculosis).

The diagnostic difficulties encountered in this case were unusual. Strong arguments against tuberculosis were the negative cystoscopic findings and, particularly, the functional integrity of the suspected kidney. According to Wildholz,[14] probably the best authority on tuberculosis of the genito-urinary tract to-day, the most unimpeachable evidence of the existence of renal tuberculosis is presented by a perceptible deterioration of function of the suspected organ. Thus, in the absence of reliable clinical evidence, the plate-findings, pointing to lithiasis, became of decisive diagnostic importance. The only clue to the diagnostic problem lay in the correct interpretation of the pyelographic plate (Fig. 3), disclosing hazy and irregular contours of all calices, which findings in the experience of von Lichtenberg and Dietlen[10] are characteristic of renal tuberculosis.

COMMENT ON DIFFERENTIAL DIAGNOSIS

From our present meager knowledge of the differential diagnostic aspect of plate shadows it appears that, in a great many instances, a correct roentgenographic differentiation between renal tuberculosis and lithiasis is not feasible. This is particularly true of one or more small and circumscribed shadows cast by scattered foci of tuberculous caseation. Such shadows look so much like stone-shadows, as for instance, in the case reported by Menhauser from Israel's clinic,[15] that a correct local diagnosis, on the sole basis of plate-findings, is utterly impossible. Only the tuberculous putty-kidney presents sufficiently characteristic roentgenographic features as to permit of a correct local diagnosis.

I am convinced from my own observation that pyelography may occasionally be of definite differential diagnostic value. This method, though, is too risky a procedure in renal tuberculosis to become a routine measure in doubtful cases.

Another source of error may arise from the possibility that a shadow seen on the renal plate is cast by an object outside the kidney. The shadow on the plate presented in Figure 4 is cast by a tuberculous lymph-gland removed from a patient who had suffered from typical attacks of left-sided stone-colic.

While, thus, the differential diagnosis of nephrolithiasis and renal tuberculosis by roentgenography alone is in most instances difficult and often impossible,

Fig. 3.—Pyelogram of tuberculous kidney. Note irregular contour of calices. Shadow of tuberculous caseation at *A*.

it is, nevertheless, capable of yielding better results with growing experience in the interpretation of suspicious shadows. It is obviously true that in order to diagnose a certain lesion one has to consider the probability of its existence. If, therefore, in the presence of one or more alleged concrement shadows on the plate, the probability of tuberculosis will always

14. Wildholz: Ztschr. f. urolog. Chir., i, 552.

15. Menhauser: Fol. urolog. iv, No. 5; see Tafel vi, Fig. 4.

be borne in mind, the occurrence of diagnostic errors will in time be materially reduced.

CONCLUSIONS

1. Roentgenography may be of definite value in the local diagnosis of renal tuberculosis when other clinical methods fail.
2. The differential diagnosis of nephrolithiasis and nephrophthisis, by roentgenography alone is feasible in the presence of marked tuberculous renal caseation (tuberculous putty-kidney).
3. It is difficult or perhaps impossible in the presence of one or more concrement shadows cast by calcified tuberculous foci within the renal parenchyma.
4. A careful and judicious interpretation of concrement shadows is imperative in order to avoid diagnostic errors of serious consequence.

999 Sutter Street.

ABSTRACT OF DISCUSSION

DR. W. M. SPITZER, Denver: None of us relies implicitly on the roentgenograms, but the more we can develop our technic and the more we can rely on the roentgenograms, the more keen our diagnosis will be. This, of course, is an argument for pyelography. We will eventually, I am sure, when sufficient work has been done, be able to diagnose from the shape of the calices and the kidney pelvis, as well as from the size of the kidney pelvis, various lesions. As to the differential diagnosis between a stone and a caseous mass in the kidney, I do not know that that can always be made. I do not think that the density counts very much. There are dense stones that do not show at all on the roentgenogram, whereas, on the other hand, there are masses of caseous material which show quite distinctly. Still, the closer attention we pay to the study of our roentgenograms, the greater aid we are going to have in making our diagnoses.

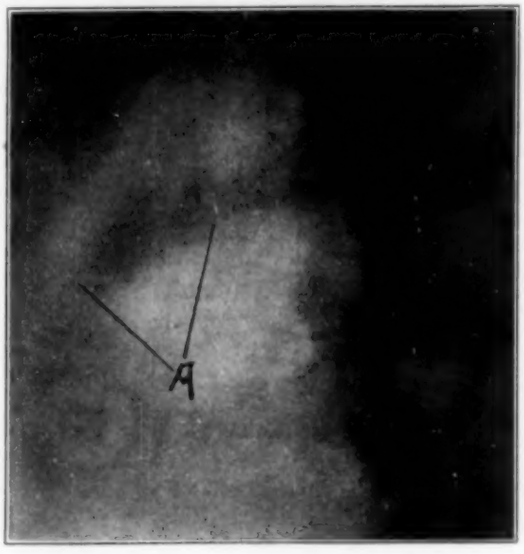

Fig. 4.—Tuberculous lymph-glands at *A*.

DR. MARTIN KROTOSZYNER, San Francisco: Though the differential diagnosis in this instance was materially aided by pyelography, this method should, if possible, not be applied in suspected renal tuberculosis, where it is considered by good authority to be particularly dangerous.

Destruction of Mosquito Larvae by Fish.—In the Gambia the destruction of mosquito larvae by fish is systematically carried out. A constant reserve of fish is maintained at the sea end of one of the drains even in dry season, and as occasion demands some are transferred to other drains, private wells, etc. More and more private individuals are having their wells stocked with fish. This it proves a more efficient prophylaxis than well-covers, which, however thorough in themselves, must of necessity be frequently removed. Fish from the sea introduced into comparatively fresh water are some time in adapting themselves to it, but after a day or two become brisk again and destroy larvae with avidity. Whether it is this change that temporarily upsets them, or the pangs of hunger eventually asserting themselves, though some fish would not touch larvae on their first day in captivity, all fish eat them greedily from the second day onward.

THE OPERATIVE TREATMENT OF TUMORS OF THE TESTICLE

WITH THE REPORT OF THIRTY CASES TREATED BY ORCHIDECTOMY*

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BALTIMORE

A well-recognized principle in the surgical treatment of malignancy is to excise widely the local growth, to make a clean dissection of all the lymphatics which drain the area and to remove the primary chain of glands into which these lymphatic vessels empty. The mortality-rate from cancer has progressively decreased with the adoption of these more and more radical methods of attack. Simple castration has been long and almost universally the treatment for malignant disease of the testes, and the majority of these patients have been seen to die of metastases which primarily involve the preaortic lymph-nodes into which the lymph-channels of the testicle drain. The radical principle which is theoretically so rational has not been generally applied to the surgery of the testicle for obvious anatomic and other reasons. Surgeons have been restrained both by the great operative difficulties and by a general belief in the futility of such an extensive procedure.

The purpose of this study is to determine from a review of the literature and an analysis of the cases of the Johns Hopkins Hospital the true value of castration and to compare this with the results that have followed the use of the radical operation in the forty-odd cases reported in the literature. Such an analysis has never been made and should give an excellent opportunity of determining the significance of preoperative duration and rapidity of growth of the tumor to the onset of glandular metastases and the significance of such metastases with respect to a choice between the two methods of operative treatment. The particular object is to find out if the radical operation is ever justified, and if so, under what conditions.

HISTORICAL

The study of testicular tumors has been chiefly confined in the past to pathologic considerations. From this point of view these tumors are of unusual interest as they show cells and tissues of almost every conceivable variety. The subject was in hopeless riot until the appearance in 1906 of the masterly pathologic and clinical study of 100 cases by Chevassu[1] which simplified the classification to practically only two types of tumor of almost equal frequency, namely, the

* Read before the Section on Genito-Urinary Diseases at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

1. Chevassu, Maurice: Tumeurs du testicule, thesis, Paris, 1906.

seminome or seminal epithelioma and the mixed tumor or teratoma. In 1911 Ewing gave the first convincing and lucid explanation of these tumors, grouping them all into the one great class of teratoma or derivatives. Pure-celled fibroma, leiomyoma and adenoma do rarely occur as do primary lymphosarcoma and spindle-cell sarcoma, which latter are of very uncertain origin and all are so infrequent as to be of no clinical importance. All so-called alveolar, perivascular and other forms of sarcomas are not sarcoma at all but are of epithelial and of teratomatous origin. These findings have since been confirmed by Wilson and others, so that clinically all primary new growths of the testicle are teratomatous in origin and of two main types, either pure round-cell embryonal carcinoma or simple or complex teratoma.

The published mortality results following orchidectomy for teratoma testes are very scanty and for the most part very unsatisfactory. Kober[2] in 1899 in an analysis of 113 cases collected from the literature found an ultimate mortality of about 80 per cent. with a three-year time limit. Chevassu[3] gave an 81 per cent. mortality with a four-year time limit. Codman and Sheldon[4] reported this year 41.07 per cent. cures in a series of sixty-four cases. The average time of those living is given as nine years, with extremes of two and twenty-eight years. The number of patients living less than four years is not stated. All cases are considered as malignant out of deference to Ewing's views.[5] The pathologic reports of the Massachusetts General Hospital for the last forty years have been accepted without a personal study, and seventeen of the cases had merely a clinical diagnosis of malignancy and no pathologic report.

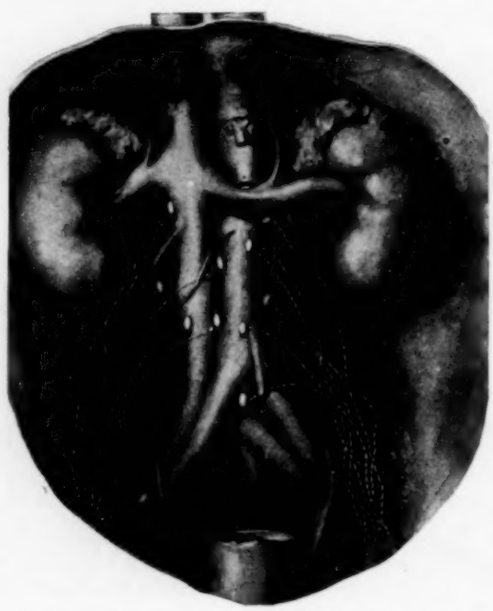

Fig. 1.—Primary lymph-nodes of the testicles. (From Spalteholtz and dissections.)

The general knowledge of a high mortality-rate and the feeling of incompleteness by simple orchidectomy have led surgeons to attempt more radical methods of treatment. Stimson[6] in 1897 advocated a high excision of the cord and removal of the inguinal glands. Villar[7] in 1901 extended the inguinal incision and with his patient in the Trendelenburg position was enabled to strip up the peritoneum for a short space and to remove the spermatic vessels higher up and also the lymphatics of the iliac fossa. Similar operations have been variously performed, but the results show no improvement over simple castration and for the reason that they do not attack the primary lymphatics of the testicle.

The primary lymph-glands into which the lymphatic channels of the testicle drain were first established by the experimental work of Most[8] in 1899. The topography of this system through additional researches of Cuneo,[9] Jamieson and Dodson[10] and others is now definitely known. The first nodes reached by the lymph-flow from the testicles number four to five on each side (Fig. 1). Those for the right testes lie in the loose adipose tissue on the vena cava, sometimes between it and the aorta, for the left, on or by the side of the aorta. Not infrequently a gland is found in the region where the ureter crosses the iliac, and occasionally there is a gland at the bifurcation of the aorta. The glandular zone is generally limited above by the renal pedicle and below by the bifurcation of the aorta. Secondary glands lie along the internal and external iliac vessels and deeply between and beneath the vena cava and the aorta. Most found no barrier between the testicle and the thoracic duct except these lumbar nodes, which are an imperfect guard, as he was able to send the injecting fluid all the way up from the testicle to the subclavian vein, which may be the route followed in general metastases. These anatomic relations have been sufficiently confirmed by post-mortem and clinical findings, which have also shown the imperfect and limited drainage capacity of these primary nodes. Secondary glandular metastases very quickly occur and general invasion of other organs is not uncommon. The only hope, therefore, from a radical operation would be the removal of the primary nodes before secondary involvement has occurred to the deeper glands whose anatomic position is such as to render their removal out of the question.

Unsuccessful attempts have been made by Kocher, von Bergemann and others to remove abdominal metastases, and it is now universally recognized by surgeons that operative intervention is contra-indicated in every case in which involvement of the lumbar glands can be determined clinically. Roberts of Philadelphia was the first to undertake (in 1901) the removal of the lumbar lymph-nodes in a case in which clinically they were not involved. He elected a median abdominal incision, opened the peritoneum, encountered insurmountable difficulties, and his patient died in a

2. Kober, G. M.: Sarcoma of Testicle, Conclusions based upon 114 cases, Am. Jour. Med. Sc., 1899, cxvii, 535.

3. Chevassu, M.: Deux cas d'epitheliome du testicule traités par la castration et l'ablation des ganglions lombo-aortiques, Bull. e. mém. Soc. de chir., Paris, 1910, xxxvi, 236; Le traitement chirurgical des cancers du testicle, Rev. de chir., 1910, xli, 628, 886; Med. d. accid. du travail, Paris, 1910, viii, 628, 887; Le diagnostic clinique des cancers du testicule, Presse méd., 1910, xviii, 363.

4. Codman and Sheldon: Prognosis of Sarcoma of the Testicle, Boston Med. and Surg. Jour., 1914, clxx, 261.

5. Ewing, J.: Teratoma Testes, Proc. N. Y. Path. Soc., 1909-1910, New Series, ix, 83; Teratoma Testes and Its Derivatives, Surg., Gynec. and Obst., 1911, xii, 230.

6. Stimson, J. C.: A New Operation for Malignant Disease of the Testicle: The Necessity of a More Extensive Operation than Castration for Carcinoma, Sarcoma, etc., of the Testicle, Med. Rec., New York, 1897, lii, 623; N. Albany Med. Herald, 1897, xvii, 537.

7. Villar, F.: Methode rationelle pour pratiquer la castration dans les cas de tumeurs du testicule, Ann. Soc. de med. de. Gard, 1902, lxxxi, 183; Cancer de testicule et kyste du cordon; castration large après section de la paroi anterieure du canal inguinale, Mém. et Bull. Soc. de med. et chir. de Bordeaux (1902) 1903, p. 295.

8. Most: Ueber die Lymphgefässe und Lymphdrüssen des Hodens, Arch. f. Anat. u. Entwcklngsgesch., 1899, p. 113.

9. Cuneo, B.: Note sur les lymphatiques du testicule, Bull. et mém. Soc. anat. de Paris, 1901, lxxvi, 105.

10. Jamieson and Dodson: The Lymphatics of the Testicle, Lancet, London, 1910, i, 493.

few days from peritonitis. His misfortune has seemed to discourage all other American surgeons, as none has since undertaken the removal of this gland area. Gregoire[11] of Paris in April, 1905, following an experience in the removal of the lumbar glands for tumor of the kidney, was led to undertake a radical procedure for teratoma testes by an almost identical extraperitoneal method of approach. The first case proved inoperable, but in August of the same year Cuneo successfully performed the operation and removed four enlarged lumbar glands, one of which showed teratomatous invasion, and the man remained well and without recurrence for three years, when he was lost from observation. The operation with slight modifications has been performed forty-one times in France, four times in England and once in Italy. The evidence in favor of an operation which is apparently so extensive will necessarily have to be very convincing before its general adoption.

It will be of value first, in view of the few and for the most part unsatisfactory statistics on the subject, to add additional data in regard to what may be justly expected of simple castration in the treatment of malignant disease of the testicle.

ANALYSIS OF CASES IN THE JOHNS HOPKINS HOSPITAL

The present study is based on a series of thirty-two patients, twenty-five of which were admitted to the Johns Hopkins Hospital—two of these were not treated—and in seven operation was performed outside and the specimens sent to the laboratory of Dr. Joseph C. Bloodgood for diagnosis.

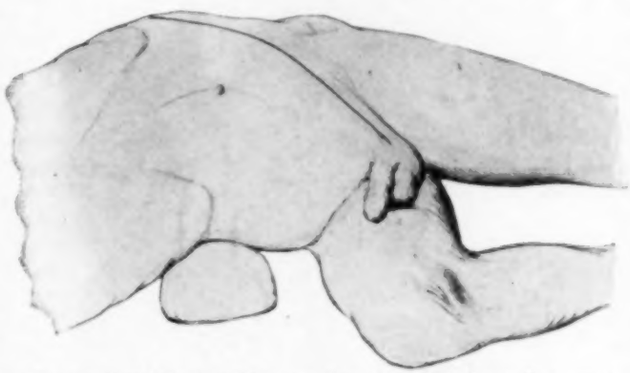

Fig. 2.—Dorsolateral position and line of incision for radical operation.

Seven of the tumors occurred in undescended testicles, which fact supports the accepted view that malignancy is relatively more common in cryptorchids than in normal men.

The ages ranged between 24 and 67 years, with an average of 39 years (age not stated in three). Eight of the patients were under 30.

In eleven of the cases some injury preceded the onset of the disease, but owing to the almost universal occurrence of injury of this kind in all men, it is difficult to place its significance.

The duration of the disease from the time it was first noticed until orchidectomy was done varied from one month to twenty years. The onset is questionable in the cases giving a long duration. In these cases there is commonly a history of injury followed by enlargement which would remain stationary or gradually increase for a time and a few weeks or months before admission would show a sudden and rapid growth with possibly pain or discomfort. The true onset of malignancy cannot be stated. The four cases of the series in which the patients are still alive had a preoperative duration of four months, two years, six years and twenty years, respectively, and of the two latter cases which give the longest duration of the series one patient was kicked in the scrotum with gradual enlargement for the six years following and the other had had gradual enlargement since childhood. The duration, therefore, gives no clinical indication of the character or degree of malignancy.

The pathologic material has been personally examined in twenty-two of the cases. Parts of all of these showed a picture typical of these testicular tumors and not duplicated by any other tumor; in the presence of characteristic large round cells in a lymphoid or fibrous stroma. In ten of the cases in addition to these typical areas of carcinoma cells there were found, either alone or in association, areas of cartilage or of cystic, glandular, myxomatous, fibromuscular or embryonic connective tissues, which places them in the group of teratomas. The round cells of the simple-cell tumors were in all cases larger than lymphoid cells, and the round-cell picture in the two types of tumors was absolutely identical. In the majority of the tumors in which cartilage was found it was present in small areas and might easily be overgrown by the more active carcinoma-cells, and this may have occurred in these pure-cell tumors. It is very possible also that areas of mixed-cell types may have been overlooked, as serial sections were made in no case. In six of the ten cases in which no material was available for study, a previous microscopic diagnosis of alveolar or round-cell sarcoma had been made. In view of the fact that the previous diagnosis of the twelve pure round-cell tumors and of three of the mixed tumors had been some form of sarcoma, it is to be supposed that these six cases were either teratomas or a one-sided development of a teratoma. These findings only confirm those of Ewing, namely, that clinically all malignant tumors of the testicle are teratomatous in origin.

There were a number of cases with the clinical diagnosis of malignancy in which the removed testicles, on subsequent microscopic examination, proved to be the seat of a syphilitic orchitis.

Metastases were clinically present at the time of the operation in four of the patients, all of whom died of carcinomatosis. Owing to the deep position of glandular metastases and their non-recognition until they have attained a considerable size, it is not possible to establish any clinical relation between the onset of such metastases and the duration of the disease, concerning which there is almost always also some doubt. Seventeen patients had retroperitoneal glandular metastases at death. In eight death is mentioned as due to general carcinomatosis, and presumably lumbar metastases were present. Necropsies were performed in three cases, lumbar metastases found in all, nodules in the liver in all and in the lungs in two.

The ultimate result is known in twenty-four cases, of which twenty patients are dead and four living. Of the eighteen cases in which the result is known and the specimens have been examined, nine are pure

11. Gregoire, R.: Considerations sur l'état des ganglions dans le cancer du testicule, Arch. gen. de chir., 1908, ii, 1; Obs. in thesis of Chevassu, 1906, 182; in Rev. de Chir., 1910, xli, 648, 654, 656.

round-cell carcinomas and nine are teratomas. Of the former group two patients are alive, twelve and thirteen years, and none of the seven patients that are dead lived over two years. Of the latter group all are dead except one patient, who is now alive for only sixteen months. One patient lived for three years, another for nine years and seven months. This case is most unusual with a history of injury forty years before the onset of tumor which preceded orchidectomy by three years. A letter from the patient six years later (1906) stated that he was well, and a letter from his wife this summer states that he died of "abdominal cancer," March 3, 1910, nine years and seven months after castration. These facts indicate that the mixed type of tumors are more malignant, though possibly of a slower form of growth, than the pure-cell carcinomas, although, since all tumors are teratomatous in origin, such a differentiation is more or less arbitrary.

The result in the four cases in which the material was not available for study but in which a previous diagnosis of sarcoma had been made gives one living now almost twelve years, and three deaths, one, two and eight years, respectively, after castration. The latter case is another remarkable instance of the long duration of life that is possible after castration for teratoma testes with ultimate death from cancer metastases. It is that of a cryptorchid who three years following double castration, at which time both testicles were found to be the seat of "sarcoma," began to have abdominal symptoms, but lumbar glands were not palpable until after six years, and death did not occur until eight years after the operation. Bloodgood places the time limit for cure in cancer of the breast at eight years, and it would seem that the limit of four years as placed by Chevassu, while only exceptionally exceeded, is not an absolutely safe period in cancer of the testes. One of Chevassu's own patients died a full four years after operation; but, as Andrews formulates it:

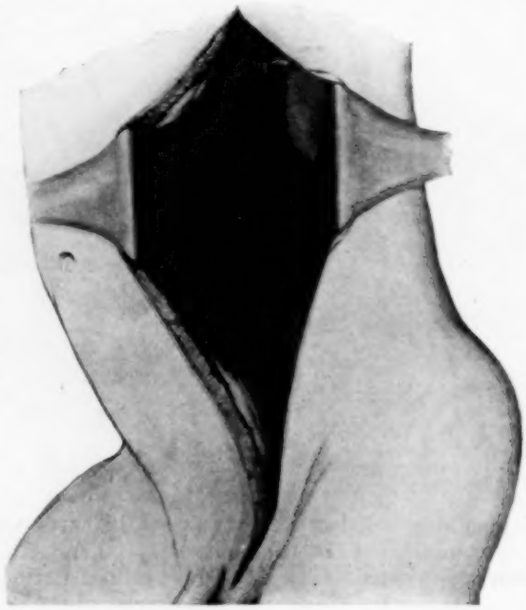

Fig. 3.—Peritoneum stripped back showing lymph area to be removed.

> The risk of recurrence in malignant growths increases as the square of the time of growth; or, conversely, the risk of recurrence diminishes in the ratio of the square root of the time after incidence.

With one exception in which death resulted a few days after operation from pulmonary embolus, all of the patients, so far as can be determined, died of cancer. Excluding this one case of embolus and the four cases in which metastases were already present at the time of operation, the series shows a cure from castration in only 15 per cent. of the cases, a high mortality-rate of 85 per cent.

ANALYSIS OF CASES TREATED BY RADICAL OPERATION

The records of forty-four attempts radically to remove the primary preaortic lymph area in treating testicular tumors have been collected from the literature. Gregoire furnishes information regarding two additional and unpublished cases. This material offers an excellent opportunity because of the exposure at operation to determine the relation of the duration, size, rapidity of growth and the character of the tumor to the onset of the glandular metastases and their early location. Inasmuch as thirty-two of the operations were performed before 1911, there has been sufficient time to allow of a comparison of the results with those following castration. Several French theses have been written on the subject (Calin,[12] Beckerich,[13] Moscarenhas[14]), but in none of these are the cases analyzed to show the operative or ultimate mortality, the relative number of cases which had at the time of the operation early metastases and the proportion of these in which these metastases, although not possible of recognition clinically, were so extensive as to be inoperable.

The technic of the operation from a study of the descriptions of the various operators and from personal dissections from which the accompanying drawings have been made is briefly as follows: The operation is usually performed in two stages, inguinal and abdominal. The first stage is that of ordinary castration and it is extremely important that the testicle be carefully examined at this time and the diagnosis definitely confirmed before proceeding to the extensive abdominal part of the operation. The fact that over 7 per cent. of the few cases so far subjected to the radical method of treatment were found on subsequent examination of the specimens to have had a syphilitic orchitis shows the importance of this preliminary study.

For the second stage of the operation the position of the patient is of considerable importance. It should be a bent dorsolateral one with the patient turned partly on his back and resting on a pad under the costal margin with shoulder and hip on the table. This raises the spine to conform to the line of the incision and allows a good exposure of the deep abdominal vessels (Fig. 2). The skin incision is extended from the upper end of the inguinal cut parallel to Poupart's ligament, curving upward in the axillary line at about 4 cm. below the anterior superior spine of the ilium to end at the costal margin. In fat, thick-bellied men, the upper end of the incision may be extended along the rib margin either anteriorly (Gregoire, Fredet[15]) or posteriorly (Cuneo). The

12. Calin, Paul: Du Traitement chirurgical du cancer du testicule, (extirpation des ganglions ilio-lombaires), Lyons, 1911, 74, p. 8.
13. Beckerich, Louis-Achille: De l'ablation des ganglions lombo-aortiques comme complément a la castration pour néoplasme testiculaire, Nancy, L. Bertrand, 1911.
14. Moscarenhas, C. O.: Contribution a l'étude du traitement du cancer du testicule, Paris, 1912.
15. Fredet, Pierre: Obs. in Bull. soc. chir., 1910, 245, and Rev. de Chir., 1910, xli, 661.

muscle-fibers and fascia are divided in a line with the skin incision down to the peritoneum, which is gently stripped back so as to expose the lower pole of the kidney and the psoas muscle. A choice is given the operator between starting above at the renal pedicle and working down or beginning below in the inguinal ring and stripping the cord and vessels up toward the lumbar region. The former method of attack appears more rational, and in the dissections by traction on the spermatic vessels at the external ring was easily accomplished. Figure 3 indicates the exposure of the lumbar field and Figure 4 the appearance after the lumbar and iliac fossae have been stripped. In cleaning the anterior surface of the aorta the inferior mesenteric artery must be protected. The spermatic vessels and the ureter usually remain attached to the peritoneum when it is stripped up in the iliac fossa, and this region should be carefully cleaned as metastases often occur where the ureter crosses the iliac vessels. The dissection should also be carried up so as to include the region about the bifurcation of the aorta. The vas deferens is readily located and divided as it leaves the internal ring. The clean removal of the vascular and lymphatic layer as outlined is far superior to the palpation and individual removal of single glands, as is sometimes described. The operation for right-sided involvement offers greater difficulties in that the area to be cleaned covers the vena cava. Good and sufficient drainage should be established owing to the large lymph area removed.

Fig. 4.—Lumbar and iliac fossae stripped clean of glands and fascia with the spermatic vessels down to inguinal ring. Vas deferens entering pelvis at point where it is divided.

From the accounts of those who have performed the operation it presents neither the difficulties nor gravity that would be expected. The patients apparently stand the operation well and show no evidence of shock, and the convalescence is relatively short. The long incision is objectionable because of the danger of hernia and of the division of numerous nerves. The tenth, eleventh and twelfth dorsal nerves are always cut, and usually the lower branch of the genitocrural. Partial paralysis of the abdominal muscles results and difficulty with the bowels is encountered during convalescence. Chevassu has shown by faradic and galvanic tests that this paralysis is only temporary. There have been no fatalities from postoperative hemorrhage or other complication as a result of injury to the large abdominal vessels. Five of the patients died of postoperative complications, three of pneumonia and two of peritonitis, an operative mortality of 11 per cent., which, considering the newness and nature of the operation, is surprisingly low.

With the exception of two cases (André,[16] Georgesco and Savesco,[17] Case 2) there was no clinical evidence of lumbar metastases before operation. Three of the cases (Cuneo, Case 2, Marion, Mercadé) were mistakes in diagnosis, the testicles in each being found on subsequent examination to be the seat of a syphilitic orchitis. Of the forty-two remaining patients, twenty are living, nine for over two years; four for over four years, the longest for four years and ten months, the shortest for one month. The average time since operation on the twenty patients who are reported alive is one year and eight months. Sixteen, or 41 per cent., have died of cancer, all within one year except two, one of whom (Gregoire, Case 1) died thirty-one months and the other (Chevassu, Case 2) four years after operation.

The duration of the disease before operation varied between two months and twelve years, with an average of fourteen months. Twenty-one of the cases had a duration under one year, and twelve of these under six months. Only three cases had a duration of over three years. While lumbar glands were palpable in only two cases before operation, twenty-two, or over 50 per cent., of the cases showed cancer invasion of the lumbar nodes that were removed at operation, and in eleven of these the involvement of the gland area was so extensive as to be inoperable. In eight of the cases in which numerous lumbar glands were removed, these on subsequent microscopic examination in no case showed cancer invasion. In three cases no lumbar glands at all were found at operation. The twenty-two cases with malignant involvement of the lumbar nodes removed at operation had a preoperative duration of from two months to twelve years or, omitting the case with a duration of twelve years, which is the longest in the series and questionable, an average of fifteen months. On the other hand, the eleven cases in which no lumbar involvement was found had a preoperative duration of from three months to fifteen months, with an average of eight months. This indicates that the preoperative duration has considerable significance with respect to the onset of glandular metastases. The significance, however, cannot be definitely determined, as many cases of short duration are seen to have extensive metastases, whereas cases of an apparently long existence may have no metastases. The chances, nevertheless, of metastases not having occurred, are greatly in favor of a case with comparatively short duration. All of the eleven patients in whom the glandular involvement was so extensive as to render its complete removal impossible are dead, except two who had been observed for only one month at the last report. Of the other fourteen patients with glandular involvement but in which the gland area supposedly was completely removed at operation, seven are living, one died of pneumonia seven days after operation, and six died of cancer recurrence.

Of the eight patients with clean glandular removal but in which no involvement could be found, five are living, and three died of cancer. Two of the three

16. André: Cancer du testicule avec extirpation des ganglions lombo-aortique, Revue méd. de l'est., 1912, xliv, 420.

17. Georgesco, G., and Savesco, V.: Etude anatomique et chirurgicale sur trois cas de cancer du testicule, Jour. de Chir. de Bucarest, April, 1914, iv-vi, 226.

patients in whom no glands at all were found are dead. Of the six cases in which no mention is made of glands, two patients are dead, one and twelve months, respectively, after operation; three are living, one, twelve and forty-eight months, respectively, and the result in one, presumably alive, is not mentioned.

Obviously all cures in those patients who had cancer involvement of the lumbar glands that were removed at operation will be directly due to the radical procedure, and just as obviously the radical procedure will be able to cure in only those early cases in which the invasion has not spread beyond the primary lymph zone. Simple castration will be of no benefit in either case, and will cure in only those very early cases in which the disease is confined to the testicle proper. Of the six patients living who had glandular metastases removed, one, in whom two of the glands removed at operation showed marked invasion, is now alive and well almost five years since the removal of these glands, three other patients are alive and with no evidence of recurrence for almost three years from the time malignant lumbar glands were removed, and the two other patients were alive after operation eight and one months, respectively, at the time of the last report.

SUMMARY AND CONCLUSIONS

1. Orchidectomy will cure from 15 to 20 per cent. of teratoma testes. Obviously a cure is possible only when the testicle is removed before the onset of glandular or other metastases.

2. A cure cannot be assured until nine years after operation, although the danger of recurrence after four years is very small (only three cases reported) and progressively diminishes.

3. Cancer of the testicle metastasizes in practically every case first and primarily to a limited zone of lumbar lymph-nodes which lie on the aorta for the left testicle and on the vena cava for the right, between the bifurcation of these vessels and the renal pedicle. Communication between these two groups and to deeper or more distant glands occurs only secondarily.

4. Involvement of these primary lymph-nodes may occur early or late, and the preoperative duration of the tumor in the testicle, its rapidity of growth or its size give no definite clinical indication of the onset or extent of such metastases, but the probabilities increase the longer the duration and the more rapid the growth.

5. Pathologic differentiation of tumors of the testes into embryonal carcinomas and mixed-cell types is more or less arbitrary as both are teratomatous in origin; but the former appears to be definitely less likely to metastasize, although more rapid in its growth. There are fewer cures among the cases of teratoma, although these give the longest duration before death.

6. The primary lymph-nodes are a very imperfect guard against secondary invasion, and metastases to other gland areas by way of efferent lymph-channels or by blood-vessels to thoracic or abdominal organs may occur early. Surgical treatment is of no avail after these secondary metastases have occurred. The only hope, therefore, in a radical operation is the removal of the testicle with its primary lymph area before the disease has spread beyond this zone.

7. The experience of various surgeons in a total of forty-six cases has demonstrated in suitable cases the feasibility and technical ease of the radical operation with a combined surgical mortality in all cases of only 11 per cent.

8. Radical operation should never be undertaken when lumbar metastases are recognizable clinically, and is applicable only in the fairly early cases in which the disease is apparently limited. Owing to the deep position of the glands, these cases cannot always be differentiated before operation, so that every case, in which clinically there is no invasion, is suitable for radical treatment. The operation should never be performed until after the diagnosis is confirmed.

9. Sufficient time has not elapsed and the cases are so scattered that it has not been possible to get the ultimate result in all of the patients treated radically. Forty-six per cent. are alive, one for five years; one for four years; five for almost three years; two for over two years and eleven for one year or less. There is a probable cure in at least four cases which had lumbar glands invaded with cancer at the time of the operation. Simple castration could not have benefited any of these cases, and their cure is directly attributable to the early and clean removal of the affected lymph area.

10. In conclusion, therefore, it may be stated that the early removal of the testicle with its primary lymph zone is the rational method of surgical treatment of teratoma testes, but the extensive nature of the operation and the fact that almost one-third of the cases thus treated were found to be inoperable warrants a very careful selection of suitable cases.

I wish to acknowledge thanks to Dr. W. S. Halstead for the privilege of using the material of his surgical clinic, to Dr. J. C. Bloodgood for the valuable material of the surgical pathologic laboratory, and to Drs. Gregoire, Pringle, Chevassu, Marion and others for data in regard to cases operated on, and particularly to Dr. Hugh H. Young for his generous kindness in furnishing financial and advisory assistance and for the use of the material of the genito-urinary clinic.

ABSTRACT OF DISCUSSION

Dr. Hugh Young, Baltimore: Dr. Hinman has thoroughly studied all our pathologic records, and I think has made all of us realize that we shall have to change our text-books and do a far more radical procedure than in the past. On account of such work as Dr. Hinman's we are compelled to note a series of bad results that we did not realize were occurring.

Dr. Frederick W. Robbins, Detroit: I wondered while I listened to Dr. Hinman's paper if he had entirely forgotten the work of Coley in connection with his serum in these cases. About five or six years ago I reported a case that shows, as I believe, the result of the use of the double injection of the erysipelas and prodigiosus bacilli. A man had a very rapidly growing tumor of the testicle, probably a teratoma, although at the time I thought it was a sarcoma, which I removed without any very extensive dissection. The tumor was about as large as my fist. That the tumor was malignant I think is proved from the fact that within ten days after it was removed another growth was formed as large as my fist. I then dissected out, very carefully, the contents of the scrotum, and without opening the internal abdominal ring went up as high as I could to get everything out, and the wound looked perfectly clean. Inside of ten days the growth was again forming so that you could see it increase in size every day. I began the injection of the double bacillus. Within two days the growth had stopped and then gradually disappeared. He was under treatment about three weeks, getting a reaction at every injection. I began with a small dose and increased the dosage. The first injection caused elevation of temperature to about 103, as I remember it, but gradually it required a larger and larger injection to get a reaction, until in about two weeks the maximum

dose was given. The growth entirely disappeared. The other day I heard from him, and he is reported to be perfectly well. We should not forget that there are such cases as I have had and as Coley has reported, which are wonderfully helped and probably cured by the double bacillus injection.

DR. EDWARD L. KEYES, JR., New York: In two cases I have endeavored to follow out practically the technic suggested by Dr. Hinman of clearing up the space between the ureter and the aorta as far as the kidney, and in both instances I have found the veins implicated in the disease, extending to and beyond the kidney. In one case there was a large mass of secondary glandular involvement even above the kidney, and in the other there was simply a venous involvement up to the kidney. Several other patients I have seen die from metastasis extending so rapidly after the disease once got started and of such wide distribution that it seemed to me that, taken in connection with the known fact that the veins of the pelvis and abdomen are frequently involved in the growth, the metastases occur by the vascular instead of the lymphatic route in the large majority of cases. If that is the case, I question whether an extensive dissection is going to help us revise our mortality statistics. I fancy the real thing is to get at the cases early, before vascular metastases have occurred and not to pinch the vessels when you are examining them.

DR. M. KROTOSZYNER, San Francisco: In connection with Dr. Keyes' remarks, I believe that the salvation of our patients does not lie so much in the radical operation as in the early diagnosis. I do not think there is any condition in the genito-urinary tract so difficult to diagnose as enlargements of the scrotum involving the testicle. It is in these cases that the Wassermann reaction has complicated the diagnostic difficulties. Any physician who has seen many of those doubtful tumors will admit that three large conditions loom up right from the start—tuberculosis, tumor and syphilis—and he will not be willing to put the patient on the operating-table before he has at least satisfied himself that a diagnosis of syphilis can be excluded. I have seen cases in which the Wassermann was slightly or even strongly positive and in which afterwards the diagnosis of primary carcinoma of the testicle was verified pathologically. What are we going to do? In one case three months had been lost by this means, not only in my hands, but in the hands of my predecessors. I think a means ought to be established by which we are enabled as early as possible to make the diagnosis. I think then the result of our operative procedures will be better.

DR. FRANK HINMAN, Baltimore: With regard to Dr. Keyes' statement concerning vascular and glandular involvement, forty-six of these cases, I think, gave a very clear indication as to the first metastasis of these tumors. In twenty-two cases the lymphatic glands were first involved at the time of operation. In eleven of these twenty-two cases the disease was so extensive as to render them inoperable. This fact, however, I think does not detract from the object of the radical operation, because four of these patients were apparently cured. An early diagnosis, of course, is the all-important thing in the treatment, but it has been shown that castration will only cure from 20 to 50 per cent. of these cases, and the radical operation, from a surgical point of view, is perfectly feasible and technically not difficult. So that in every case the lymphatic region should be explored. There certainly will be a small proportion of patients who will be cured by the radical operation who otherwise would certainly die.

"Idiopathic" Insomnia.—Insomnia is a symptom always; it is never a disease. In many text-books there is a reference to "idiopathic insomnia." That is the insomnia described by the ignorant man. We are all ignorant on this subject, and the best thing is to admit our ignorance, rather than trying to satisfy our consciences by describing it as idiopathic, or putting a long title to it or classifying it, and concluding that all is well.—H. Crichton Miller, *Medical Press and Circular.*

DIVERTICULA OF THE URINARY BLADDER

WITH REPORT OF CASES *

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The increasing literature regarding diverticula of the urinary bladder and the frequent reports of cases which are now appearing indicate, in my opinion, not that this condition is occurring more frequently than formerly, but that it is now being more accurately diagnosed and that its treatment is now yielding more satisfactory results. Very complete reviews of the literature on this subject have been made by Fischer[1] and by Lerche,[2] who show that opinions regarding the exact etiology of diverticula still vary. Some writers believe that diverticula are always congenital while others contend that they are acquired, the point of differentiation being the presence or absence of muscular fibers in the walls of the sac forming the diverticulum. If muscular fibers be present it still is considered by many that the diverticulum is of congenital origin. If, however, the sac be formed only of mucous membrane, that is considered evidence that the diverticulum is acquired. It has been shown recently, however, that in practically all cases some muscular fibers are found in the sac wall, though they often are very much attenuated.

It seems to me, however, from the clinical aspects of the cases that have come under my observation and are here reported, that these diverticula were acquired, and the argument, which also applies for most diverticula, is: 1. They scarcely ever are found in the very young, but for the most part in persons past middle life, a time at which obstruction to urinary outlet most frequently occurs. Necropsies on children do not show this condition, or at least its presence is not mentioned in most post-mortem records. Such anomalies as hour-glass or double bladder which are occasionally reported at post-mortem findings in children are generally associated with double urethras or multiple ureters and other abnormalities and should not be considered identical with true clinical diverticula. 2. They very seldom occur in women, the ratio being about one to ten. 3. In most cases the bladder wall is much thickened, a condition present in most cases indicating obstruction to the urinary outlet, which produces more or less retention. In the one case of a woman in my own series a urethral caruncle was present which caused her so much pain that she refrained from voiding as much as possible and never completely emptied her bladder.

Even Englisch, as quoted by Fischer, believes that the so-called congenital diverticula are "based on the presence of some obstacle to the outflow of urine, in consequence of which the weak points of the muscular arrangement of the bladder give way. These obstacles may be produced by inflammatory conditions of the bladder or urethra during intra-uterine life but which have healed up, leaving no vestiges after birth."

That there probably is some congenital condition of the bladder wall which under certain conditions, such, for example, as obstruction and overdistention for a

* Read before the Section on Genito-Urinary Diseases at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

1. Fischer: Congenital Diverticula of the Bladder, Surg., Gynec. and Obst., 1910, x, 156.

2. Lerche: The Surgical Treatment of Diverticula of the Urinary Bladder, with Report of a Case and a New Device for Facilitating the Operation, Ann. Surg., 1912, lv, 285.

long time, will produce a diverticulum, is true without a doubt, but the opinion that these diverticula exist as such from early childhood does not seem to me to be tenable.

While it would be of very great interest to know definitely whether all diverticula are congenital or all are acquired, or whether a certain number are congenital and others asquired, it is not of as much importance as to know how to diagnose the condition and how best to treat it, and it is to the diagnosis and the

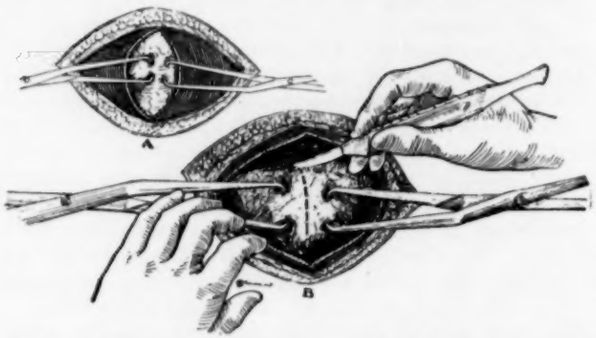

Fig. 1.—*A*, separation of muscles, bringing the bladder up with curved forceps; *B*, dissecting the bladder free from the peritoneum.

treatment therefore that I specially wish to invite your discussion.

DIAGNOSIS

The presence of diverticula can nearly always be determined by the cystoscope in the hands of a person who is experienced in its use, but may be easily overlooked by the inexperienced. The diverticulum opening is sometimes so very small that it looks like a mere dark speck in the field. This apparently insignificant speck, however, may be the opening of a very large diverticulum. If the presence of a diverticulum is evident or is suspected, the diagnosis may be made certain and the size and exact location of the sac determined by the aid of collargol and the Roentgen ray. A posterior sac may be overlooked by an anterior-posterior picture, but it can generally be detected by taking a picture at an angle. This seems to me a more exact method than to measure the size of the sac with a ureteral catheter.

SYMPTOMS

Frequent urination induced by the constant presence of residual urine in the sac is the most common symptom. In most cases the frequent urination and the failure to empty the bladder completely do not cause any special annoyance until infection and cystitis develop, when the patient seeks advice because of the painful symptoms of these conditions. Catheterization may not result in the withdrawal of much urine, for the catheter may not enter the orifice of the diverticulum. If the diverticulum be infected, the urine, even after repeated irrigations, is cloudy and in a great many cases is very fetid.

If the diverticulum be very large, a definite tumor may be detected by rectal or vaginal examination, or even by abdominal palpation. Hematuria frequently occurs also.

TREATMENT

If the opening of the diverticulum be small and the sac large as is frequently the case and if infection be present, palliative treatment is of no avail, for as it is impossible to cleanse the diverticulum thoroughly the infection cannot be checked. Unless radical measures be taken the infection will in all probability ascend, and will produce secondary and often fatal renal involvements.

Many kinds of operative treatment have been advised, but the radical treatment for complete removal of the sac did not have much success until comparatively recent time because the removal of the sac was difficult, and complications and unfavorable results often followed. In his report in 1912 Lerche collected but fourteen cases and to this list appended one of his own in which diverticula had been treated by excision; to his list may now be added cases reported by Cabot, Chute, Bergener, Bryan, Marion, Beer, Lower and others. In most cases excision has been followed by permanent good results. To a large extent, of course, the success of excision depends on the technic. In my own earlier cases I divided the bladder down to the diverticulum, separated the attachment to the bladder and then tried dissecting the sac away from its surrounding tissues. On account of the collapsed sac this method proved very unsatisfactory in two cases, and I had a definite recurrence in one in which it was evident that the entire mucous membrane had not been removed.

In two cases in which the diverticula were rather shallow I everted the sacs and brought them up into the bladder and excised and closed over the attachment with chromic catgut.

As diverticula are often situated near the ureteral orifices so that not infrequently the ureters empty into them, they must either be resected and transplanted or else dissected out by the ingenious flap method described by Young.

The method of removal which I have found the most satisfactory and which I believe is applicable to practically all cases is to convert the sac into a solid tumor by the method described incidentally in a case reported by Cabot[3] in 1912. In general the method described by Lerche in his report of using a small rubber bag inserted into the diverticulum and then

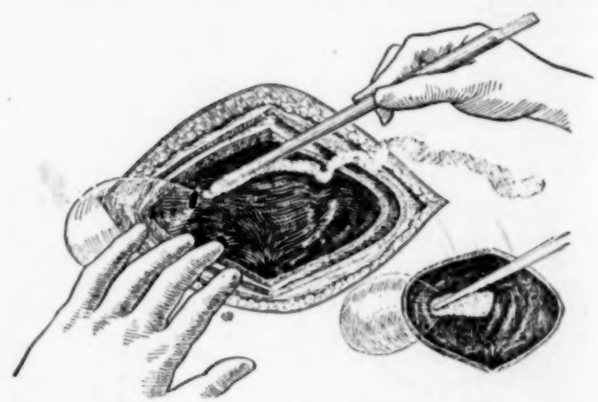

Fig. 2.— Packing the diverticulum with gauze.

inflated, answers the same purpose, but is not so easily done.

In three of the cases which I shall report I first packed the sacs tightly with narrow strips of gauze and was then able to remove them completely without the slightest difficulty. In one case the tumor was quite large. In another the diverticulum was much smaller. In the third case there were four separate and distinct diverticula, three of which were easily

3. Cabot: Tr. Am. Assn. Gen.-Urin. Surg., 1912, vii, 62.

removed after they had been packed tightly with gauze, while the fourth was removed by bringing the sac up through the bladder. In these three cases the convalescence was uninterrupted and in two there have been splendid functional results, but in the third there is still some residual urine which I believe to be due to a prostate which I did not completely remove at the time, although I did remove a projecting lobe which seemed to obstruct the urethra. In three out of five cases of men in each of which I particularly noted

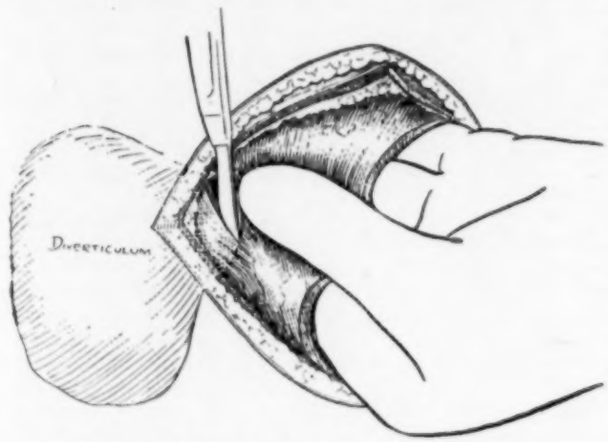

Fig. 3.—Division of the attachment of the diverticulum.

the urethral outlet there was distinct evidence of obstruction by small projecting lobes of the prostate, and in the other two the lateral lobes of the prostates were enlarged.

I have already referred to the case of the woman whose urethra was partially obstructed by a caruncle. In the late cases that have come under my observation I was able to determine the size and location of the diverticula by the use of collargol and roentgenoscopy. In three cases I was able to get postoperative pictures. These show the entire absence of the diverticula which are visible in the preoperative pictures.

By using collargol and the Roentgen ray for diagnosis, and by comparing the preoperative and postoperative pictures, we are able to draw very definite conclusions regarding the value of excision in these cases.

In those cases in which excision seems to be impossible, the method which has recently been suggested and so practically applied by Squier[4] is well worth a trial. He advises that a large communication be established between the bladder and the diverticulum by the use of clamps and sutures after the manner of a gastro-enterostomy.

In two cases I tried to make the diverticulum a part of the bladder cavity by dilating the orifice, but this procedure was unsuccessful in each instance as contracture followed. One patient was operated on a second time, and the other still has trouble.

TECHNIC OF OPERATION

In all the cases in which I have removed the diverticula by the method of first converting them into solid tumors, the following method was used:

1. Nitrous oxid-oxygen anesthesia with local infiltration of novocain.

2. Transverse incision through skin and fascia.

3. Infiltration of muscles. Separation of muscles and bringing the bladder up with curved forceps, and then dissecting the bladder free from the peritoneum (Fig. 1, *A* and *B*).

4. Packing the diverticula tightly (Fig. 2).

Then with the fingers inside the bladder, the index-finger in the opening of the diverticulum and the thumb on the outside, the attachment to the bladder is exposed and divided (Fig. 3).

The bladder is then retracted away from the diverticulum, traction is made on the tumor and it is dissected free from the surrounding tissue (Fig. 4).

With some of the tumors this last step was not necessary—the tumor could be brought up first and the dissection from the attachment of the bladder made secondly.

REPORT OF CASES

I wish to append herewith report of seven cases, in six of which operation was performed for the removal of the diverticula. Two other cases which I have seen are not classified herewith because I did not determine the depth or size of the diverticula, and the openings that were visible may have been but shallow depressions; but the cases cited are those which had a definite well-marked and demonstrable sac. Six of these were men and one a woman, the oldest was aged 78 and the youngest 43, average age 59. In every case there could be demonstrated an obstruction to the urethral outlet. The diverticula were single in four cases and multiple in three. The largest number in any one case was four. In one case I first did the operation of enlarging the diverticulum opening. This not giving relief, I later resected the diverticulum and drained through the perineum.

CASE 1.—Man aged 49, a letter carrier, referred by Dr. Wheeland. Complaint was bladder trouble. Family history

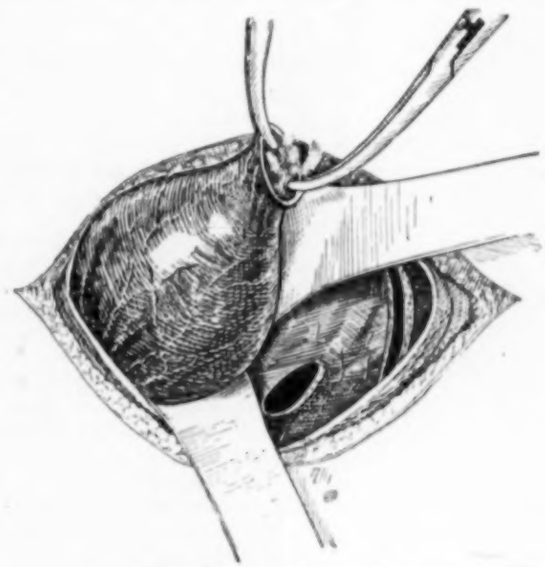

Fig. 4.—Removal of diverticulum.

had no bearing on the case. The patient had specific urethritis when 44—five years previous. Denies any luetic infection. Two years ago began to have difficult urination. Lost 10 to 15 pounds in the last year or two. No other symptoms besides the ones mentioned above. Has catheterized himself since February, 1909.

Cystoscopic Examination.—Bladder capacity 300 c.c. Required many repeated irrigations in order to get the fluid

4. Squier: New York Med. Jour., 1914, xcix, 1026.

sufficiently clear for observation. Situated on the bottom of the bladder near the left ureteral orifice is a large opening of a diverticulum from which, with the finger in the rectum, very cloudy solution could be expressed.

Operation.—Diverticulum was full of foul-smelling fluid. The opening was dilated. An attempt was made to remove the diverticulum from within the bladder, but this was not successful. A temporary drain was put in the bladder and the diverticulum irrigated through the tube. After being

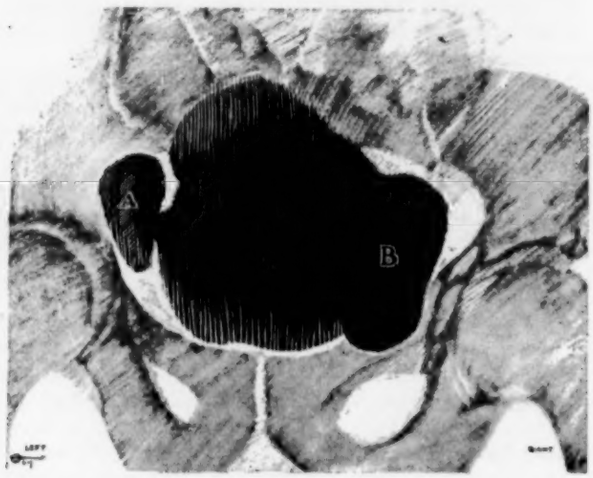

Fig. 5.—Outlines of diverticula (Case 4) as shown by Roentgen ray.

irrigated for several weeks the patient was able to void without much difficulty, but could not completely empty the bladder. He left the hospital very much improved. He returned again six months later.

Second Operation.—Suprapubic incision as before. Bladder opened and divided down to the opening of the diverticulum. The diverticulum was cut away from its attachment to the bladder and an attempt made to dissect it out. This was only partially successful. An opening was made from this cavity through the perineum and a drainage tube inserted. It required six weeks for the perineal wound to heal, the suprapubic wound in the meantime having closed. Patient was very much relieved for a considerable time, but later began to have the same symptoms again. Cystoscopic examination two years later revealed bladder capacity of 300 c.c. Ureteral orifices plainly seen and in the region of the original opening of the diverticulum is another opening. Undoubtedly a reformed diverticulum the size of which I could not determine; as no picture was taken with collargol, exact size is not known. The patient has promised to return for further observation and treatment.

CASE 2.—Man, aged 58, commission merchant, came under my observation through the courtesy of Dr. Garnhart. Principal complaint was pain in the region of the bladder and difficulty in urination. For the past eight or nine years he had slight burning on micturition. One year ago pain was very severe. Had great difficulty in starting the flow and could pass only a few drops. Pain subsided at the end of urination. After having sounds passed, which caused slight hemorrhage, he was obliged to use a catheter for several weeks, and for some time afterward the attacks would come on when he had been exposed to cold, necessitating the use of the catheter. Urine became very putrid, cloudy and foul smelling. A physician catheterized him daily and washed out the bladder. When a desire to urinate came on he had extreme pain.

Roentgenoscopy of kidney and bladder was negative; catheterization drew from 8 to 10 ounces of urine. Cystoscopic examination shows a very greatly inflamed bladder with an opening of a diverticulum situated on right side near right ureteral orifice.

Operation.—Median incision, bladder exposed and incised in a longitudinal direction. The opening of the diverticulum was seen at the base just to the right of the median line. The opening was quite small and on pressure a very turbid fluid was seen to exude. Judging from the amount of fluid emptied from the diverticulum, it seemed to me as though the diverticulum was about half the size of the bladder. The opening of the diverticulum, which admitted only a small sound, was dilated and an attempt made to invert the sac. This we were unable to do. The opening of the diverticulum was then enlarged to the width of about 2 inches. On account of patient's condition being bad, further effort at resection was not made. Rubber drain inserted down to the diverticulum. Closure of fascia with interrupted chromicized catgut and the skin with silkworm-gut.

After bladder was opened the prostate was found to be somewhat enlarged, which was thought to act as an obstruction, but prostatectomy was not done because of the condition of the patient. He made an uninterrupted recovery. At the end of two weeks wound was healed and catheter removed. Patient was able to void urine very comfortably for a short time; then suprapubic wound reopened and discharged for a number of weeks. The patient now feels quite comfortable, the severe irritation which he formerly had has disappeared and by daily irrigations he is able to keep the bladder in very good condition. He has gained in weight and his general condition is much improved, but he still has to depend on the catheter.

I did not inject collargol or take a picture and consequently cannot show the exact size of the diverticulum; but at the time of operation the diverticulum was explored with finger and found to be very deep.

CASE 3.—Man, aged 43, married, merchant, complains of difficult urination. Family and personal history unimportant. Neisser infection twenty-five years ago. Denies lues. Urethral stricture for about fifteen years. About one and one-half years ago present trouble began; difficult urination. Had trouble in starting stream. At times there have been intervals when he would be very much better, then there would be a great amount of pain. He would usually be relieved by taking hot sitz-baths, and would pass the urine

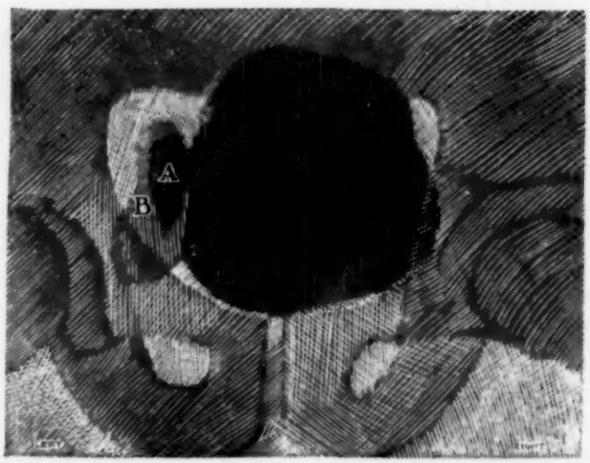

Fig. 6.—Diverticula (*A, B*) as shown by Roentgen ray (Case 5).

much more easily. Kept on getting worse and at times there would be a great amount of pus present in the urine. Collargol and roentgenoscopy revealed a diverticulum just posterior to the trigonum on the right side.

Operation.—Under nitrous oxid and novocain a transverse incision was made, fascia dissected up, muscles infiltrated with novocain, bladder exposed and incised. Bladder wall very much thickened. Mucosa much inflamed, and at the bottom of the bladder could be seen a thick white pus welling up into the opening of the diverticulum. The edge of the diverticulum

was caught up with curved hooks and the whole base of the bladder lifted. Then a hemostat was introduced into the diverticulum and the diverticulum invaginated without very much difficulty, cut off and the opening closed. The bladder wound closed with chromicized catgut. On inspecting the urethral orifice to discover the cause of his retention a small protruding middle lobe was seen extending 1 cm. into the bladder. This was found to act as a valve over the urethral outlet and was removed. The opening of the bladder was

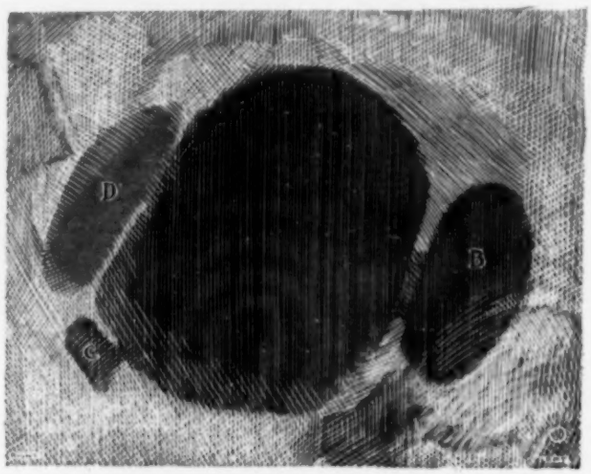

Fig. 7.—Diverticula (*B, C, D*) as shown by Roentgen ray (Case 5).

closed with chromicized catgut. Catheter inserted into the urethra and allowed to remain. Primary union. Patient left hospital in good condition and recently reported that he is free from his old symptoms and feeling splendid.

CASE 4.—Farmer, aged 78, entered hospital, October, 1913, because of painful and frequent urination. Family history has no bearing on present trouble.

Cystoscopic Examination.—Required repeated washings to admit of observation. About 200 c.c. of boracic-acid solution injected into the bladder. Introduction of the cystoscope easy. On the right side near the ureteral orifice is an opening from which cloudy fluid escapes. This is undoubtedly the opening of a diverticulum. He was sent from the cystoscopic room to the Roentgen-ray room for roentgenoscopy after collargol had been injected into the bladder. A very large diverticulum situated posteriorly, and a smaller one situated laterally, were revealed (Fig. 5). He has an enlarged prostate, but because of his age and feeble condition, and with past experience with diverticula I decided that the risk was too great and the outcome too uncertain, so he was allowed to return home. No report has been received from him since.

CASE 5.—Man, aged 54. Complaint, bladder trouble. Family history unimportant. No venereal history. About five years ago had a sound passed because of some irritation at the neck of the bladder. Since then he has had more or less difficulty in voiding urine. Has rather frequent desire to void and is unable to empty the bladder completely. Urine has become very cloudy and foul smelling.

Cystoscopic Examination.—Bladder capacity 300 c.c.; bladder mucosa very much inflamed—both lobes of prostate enlarged—bladder much trabeculated, and several dark openings from which turbid fluid escaped could be seen. Bladder was injected with collargol and a roentgenogram taken anteriorly, posteriorly and at an angle. The pictures show the presence of four separate pouches (Figs. 6 and 7).

Operation.—Nitrous oxid and novocain. Transverse incision. Fascia divided transversely, muscles separated, bladder exposed and opened. Openings of the diverticulum were readily seen. Small strips of plain gauze were packed into the openings on the left side, converting the sacs into semi-solid tumors. They were then dissected down on from the outside of the bladder and were easily detected as tumors attached to the bladder wall. They were excised at the attachment of the bladder and openings closed with No. 00 chromic catgut. A smaller one on the right side was treated in the same way. A similar one near the median line was invaginated and removed through the bladder without packing. Opening closed. On examining the internal urethral orifice a middle lobe of the prostate was seen projecting and was removed. The bladder opening then closed and catheter inserted into the bladder for drainage.

Patient made an uneventful recovery and left the hospital in three weeks' time. A postoperative roentgenoscopy revealed complete absence of the tumors present in the first picture.

Report from patient a short time ago shows that the urine is quite clear although he does not quite empty the bladder. Probably more of the prostatic obstruction should have been removed.

CASE 6.—Man, aged 59, machinist. Complaint, painful and difficult urination. Family history unimportant. Previous to present illness has had no difficulty or frequency. Never any history of renal colic. No hematuria. Had a Neisser infection about thirty years ago. Patient first noticed frequency, difficulty and diminished stream five months ago. Previous to this time was perfectly well. Says he does not know the cause of the frequency. Has had no chill or fever. Six weeks ago had to be catheterized. Has not voided voluntarily since. Never has had any incontinence.

Cystoscopic Examination.—Bladder capacity 300 c.c. Required considerable washing to clear up the solution sufficiently to make an observation. Bladder very much trabeculated; at the right side a little above the ureteral orifice is a small opening which is the entrance to a diverticulum. Collargol injection and roentgenoscopy revealed presence of large diverticulum in the posterior part of the bladder (Fig. 8).

Operation.—Nitrous oxid and novocain. Transverse incision. Fascia dissected up, muscles separated. Bladder exposed and opened. Flexible retractors inside of bladder; small opening in the bottom of the bladder was plainly seen. From this exuded some dark fluid undoubtedly part of the

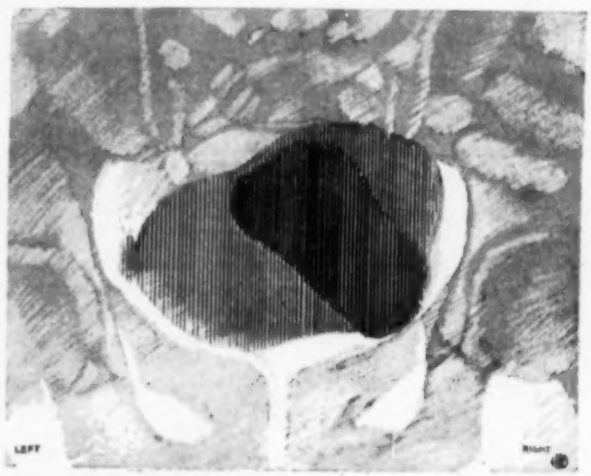

Fig. 8.—Large diverticulum in the posterior part of the bladder (Case 6) as shown by Roentgen ray.

collargol. The opening was packed with narrow strips of gauze, in all about seven yards. The tumor then formed was exposed from the outside of the bladder. It could not be easily brought up. After having exposed the attachment to the bladder it was divided, the bladder pulled aside and with forceps on the neck of the tumor, traction was made on it and by careful dissection it was freed from its surroundings. After the attachment was divided it was found that the right ureter had been involved and had been divided.

Catgut was placed around the ureter after the tumor was removed and it was transplanted into the bladder through the opening from which the diverticulum had been severed. Prostate was quite large and bulged into the bladder cavity. As this was considered to be the cause of the diverticulum, prostatectomy was done. Prostate was easily removed; middle lobe was quite large. The mucous membrane over the cavity from which the prostate had been removed was pressed down with small narrow strips of gauze. Catheter allowed to remain in through the urethra, and the bladder wound left open. Small rubber cigarette drain was placed outside of the bladder in the cavity from which the diverticulum had been removed. This diverticulum was quite large.

Postoperative roentgenoscopy with collargol revealed no evidence of any former tumor. Patient made an uninterrupted recovery and has been entirely well since. Able to empty bladder easily and completely.

Case 7.—Woman, aged 74. Complaint, frequent and painful urination. Family history is unimportant. Personal history, general health only fairly good. Pneumonia at 68. For years she has had extreme annoyance during urination because of a very painful caruncle of the urethra. This had been removed, and while relieved of most of the annoyance which she previously had, she still had frequency of urination and pus in the urine. She has had autogenous vaccine treatment.

Cystoscopic Examination.—This disclosed a small opening on right side of bladder above ureter. Roentgenoscopy with collargol showed a well-defined diverticulum on right side of bladder.

Operation.—Nitrous oxid and novocain. Transverse incision; fascia divided transversely and dissected free. Muscles separated, bladder exposed and incised. Interior of the bladder exposed with a smooth flexible retractor and the opening of the diverticulum plainly seen. Through this into the diverticulum were inserted narrow strips of gauze sufficient in amount to pack the diverticulum very tightly. Then with fingers inside of the bladder and tip of the index-finger at the entrance of the diverticulum the bladder was pulled aside, the adjoining tissues dissected free and the neck of the diverticulum exposed. Without any difficulty I was able to dissect around this, bringing it up; as it was a well formed semisolid tumor now, it was easily removed from its bladder attachment. The opening in the bladder was closed with No. 00 chromicized catgut, both from within and outside the bladder.

Patient made an uninterrupted recovery and recently reported that she is entirely well. Postoperative collargol picture shows no evidence of former tumor.

1021 Prospect Avenue.

ABSTRACT OF DISCUSSION

Dr. Martin Krotoszyner, San Francisco: The diagnosis of diverticulum of the bladder may occasionally be very difficult, even in the hands of the trained cystoscopist. I recently observed a man of 57 who entered the hospital with a severe pyuria which I at first interpreted to be due to involvement of the so-called middle lobe of the prostate. For two or three weeks it was impossible to obtain a clear picture of the bladder, in spite of repeated cystoscopic sittings, on account of the fact that invariably the almost clear bladder fluid suddenly became cloudy. I suspected the pyuria to be due to a pyonephrotic focus until this suspicion was removed by successful bilateral ureteral catheterization. Finally, after a great deal of laborious work, it was possible to clear up the bladder to such an extent that a large diverticulum could be seen, situated about 1 or 2 cm. below and to the left of the right ureter.

Dr. George Smith, Boston: Has Dr. Lower had any of these cases which have not shown much residual urine? Has he met any diverticula in which the mouth was so small that the contents would not come out on catheterizing the bladder?

Dr. William E. Lower, Cleveland: In reply to the question of Dr. Smith, in only one case was the orifice so small and the muscular contraction about the opening so strong that the contents could not be emptied by catheterization. This is a condition that must be borne in mind, and especially if we depend on the amount of residual urine as a diagnostic factor.

ACUTE PARENCHYMATOUS GLOSSITIS*

VIRGIL LOEB, A.B., M.D., D.D.S.
ST. LOUIS

The basis of this paper is a case of acute parenchymatous glossitis which I reported superficially in a paper entitled "Unusual Cases in Oral Surgery," read before the St. Louis Dental Society during May, 1911.

In connection with the detailed report of the case which I now propose to give, I desire to enter into a brief discussion of the disease and the literature relating to it. Butlin, in his book on "Diseases of the Tongue" says:

> Acute inflammation of the tongue is admitted by all observers to be a rare disease. Even the largest hospitals in this country [England] do not, in most years, record a single instance. Yet the history of the disease may be written with tolerable accuracy, for the very rarity of acute glossitis has led to the publication of a goodly number of cases in medical literature.

From the reports of cases which I have been able to review, acute parenchymatous glossitis has been spoken of as acute glossitis, idiopathic glossitis, phlegmonous glossitis, deep glossitis and interstitial glossitis.

Baldwin[1] describes a case which he had observed, under the title "Interstitial Glossitis," and Wagner[2] reports a case using the term "Idiopathic Glossitis." Saenz[3] and Dupérier[4] each speak of the disease as *Glossité profonde* rather than as *Glossité parenchymateuse.*

The disease is noticed most often during the winter months and attacks males more frequently than females. It occurs chiefly between the ages of 20 and 40, though Bennett,[5] in reporting a study of the literature from 1816 to 1906, states that cases have been reported at 9 months and 80 years of age.

Among the etiologic factors relating to acute parenchymatous glossitis, exposure to cold and dampness together with a lowered general resistance seem to be the most potent. Infectious diseases also play an important rôle. Weis[6] described a case which followed the desquamation of scarlet fever. Sabrazes, Bonnes and Parsat[7] report a case in a man whose children had had scarlatina just previous to his illness and they thought the patient may have had a scarlatinal throat. No specific germ has been isolated, though streptococci and staphylococci have been found.

Predisposing causes are injuries to the tongue from carious teeth, faulty dental work, tooth-picks, splin-

* Read before the Section on Stomatology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

1. Baldwin: Cincinnati Med. Jour., 1896, ii, 143.
2. Wagner: Med. Rec. New York, 1893, xliv, 523.
3. Saenz: Contribution à l'étude de la plossiti profonde aiguë, Montpellier, 1906.
4. Dupérier: Thèse de Paris, 1906-07.
5. Bennett: Washington Med. Ann., 1906-07, v, 267.
6. Weis: Loire méd., 1908, xxvii, 366.
7. Sabrazes, Bonnes and Parsat: Presse méd., 1906, xiv, 303.

ters of wood and other foreign bodies. Gerhard[8] adds as further causes the action of corrosive substances, hot liquids and the stings of insects.

Sore throat often precedes an attack as in cases described by Washburn[9] and Green.[10]

The disease is usually ushered in by pain which is located in the tongue but often in no specific area. This pain comes on suddenly and increases gradually in severity. Accompanying it, though not always immediately, there develops a swelling of the tongue which increases rapidly until the organ fills the entire oral cavity, and often protrudes outside the mouth. In some cases designated as hemiglossitis, the swelling is limited to one side, usually the left. Bennett[5] found from a study of 145 cases that in 85 the entire tongue was involved. In 36 the glossitis was limited to one-half of the tongue, and of this number 20 cases were on the left side. Thomas[11] reports one case of hemiglossitis and Duckworth[12] and Copland[13] each report four. In the majority of these the left side was involved. Coincident with the swelling there is a rise of temperature with a corresponding pulse and salivation. The tongue is covered with a dark brownish fur on the dorsum and is tense, dry and hot. Deglutition is impossible and breathing very difficult. There is extreme discomfort and the facial expression is one of great anxiety. The cervical glands are usually palpable.

Dr. Loeb's case of acute parenchymatous glossitis.

Butlin[14] says the diagnosis of acute parenchymatous glossitis "is generally so easy that it seems almost unnecessary to speak of it." He states, however, that it is at times difficult to differentiate from acute edematous swelling due to salivary calculus and other affections of the floor of the mouth. Bennett adds acute ranula and herpes of the mouth, lips, tongue or pharynx as diseases from which it should be diagnosticated.

The pathology is simply that of an acute violent inflammation. Thebaud[15] says there is a violent injection and swelling of the lymph-vessels chiefly in the muscular structure of the tongue.

The prognosis of acute parenchymatous glossitis should be guarded, on account of the complications which may arise in all cases. Bennett, however, states that of 145 cases which he reviewed, only four ended fatally or less than 3 per cent. Recovery may be by resolution, or suppuration may develop. In some cases gangrene takes place, which renders the outcome very grave.

The treatment should be immediate and surgical. Deep longitude incisions along the dorsum of the tongue on either side of the median line seem to be generally accepted as the best procedure. Sonbeyrau[16] recommends a median incision.

Saenz[3] after a study of eight cases, states that since glossitis often ends spontaneously, it is prudent to await this, provided no alarming complications develop. Dupérier[4] also reports eight cases, but recommends immediate deep longitudinal incisions.

If suppuration has developed, free drainage must be obtained. Thebaud[15] reports seventeen cases and in his conclusion states that when a deep abscess develops at the base of the tongue which cannot be reached by the oral route the same must be attacked from without.

In cases which develop gangrene, cauterization should be used. In addition to the purely surgical treatment, antiseptic mouth-washes should be used freely, together with constant cold applications to the tongue. Pain should be allayed by the use of morphin, etc.

REPORT OF CASE

Patient W. O. A., white, married, aged 50, traveling salesman by occupation, consulted me first Nov. 9, 1910. Patient gave the following history:

Eleven days ago while in the South he began to notice pain in his tongue. He could locate it at no definite point but said it seemed to be in the substance of the organ. The only cause which he could give was that he was in the habit of whittling pine sticks and sticking the splinters in his mouth. He thought he had scratched the under surface of his tongue with one of these splinters. He also had been chewing some fresh perique tobacco. The pain became steadily more intense, especially on the right side, and was more noticeable when swallowing. He remained in the South for several days under treatment, but obtained no relief.

The patient was a well-built, robust man, color good, with facial appearance one of extreme uneasiness. Physical examination, negative. Personal history, negative. Denied syphilis.

Examination of his mouth revealed a somewhat inflamed mucous membrane and several carious teeth. The tongue was apparently not swollen, nor was it especially inflamed. There was a small abrasion which was healing on the right side, but otherwise it was apparently normal. One gland in the right anterior cervical region was slightly enlarged. Temperature normal. The patient was extremely nervous. He said he had taken practically no nourishment for three days. On pressure over the right side of the tongue, far back near the base, the patient complained of excruciating pain.

The patient was sent to a hospital and cold applications to the throat and tongue ordered. Aspirin, 5 grains, was given every three hours. That night the patient slept fairly well and felt somewhat relieved the following morning. An examination of his urine at that time showed some albumin, hyaline and granular casts and a few pus cells.

The relief which the patient had had continued only until the afternoon of the second day in the hospital, November 10. The pain then returned in increased severity. Large doses of aspirin were given and veronal in 5-grain doses, with little relief.

November 12, for the first time, a slight edema around the orifice of the right Wharton duct was noticed. There was still no swelling of the tongue. That afternoon a neurologic examination was made by Dr. S. I. Schwab, but nothing which might be responsible for the pain was found.

By November 13, a most spectacular change had taken place in the tongue. It had become swollen until it prac-

8. Gerhard: Codex Medicus, Philadelphia, 1896-97, iii, 42.
9. Washburn: Med. Rec., New York, 1896, l, 172.
10. Green: Med. and Surg. Rep., Philadelphia, 1891, lxv, 333.
11. Thomas: Marseille méd., 1905, xlii, 512.
12. Duckworth: Liverpool Med. Chir. Jour., 1883, iii, 195.
13. Copland: Dict. of Med., iii, 1077.
14. Butlin: Diseases of the Tongue, 1900, p. 69.
15. Thebaud: Paris Thèses, 1893-94.
16. Sonbeyrau: Montpellier méd., 1902, ii, 687.

tically filled the entire mouth cavity. It protruded from the mouth, was very dry and hot. Temperature 100 F. The patient was semiconscious, breathing very heavily. Nourishment was given by nasal tube and water by rectum. A blood-count was made showing 12,478 leukocytes. Urine examination showed a large amount of albumin, hyaline and granular casts and a few blood and pus cells.

A consultation was held with Dr. P. Y. Tupper and an immediate operation determined on.

After anesthetizing the tongue with local applications of cocain, I introduced an aspirating needle for the purpose of determining whether or not an abscess was present, and also for the purpose of reducing the pressure by local bleeding. I aspirated ten times in as many different places, and at different depths, but found no pus present. The bleeding was profuse. The patient was put to bed and continuous ice-cold irrigation was applied to the tongue. Nasal and rectal feeding were continued.

Patient had a most uncomfortable night, with severe pain, which was relieved only by a large dose of morphin. Patient felt better by morning. From this time he began to improve. The temperature rose to 101, dropping gradually, and except for acute exacerbations of short duration the pain became less intense. Within four days the tongue had become reduced to such a size that the patient could talk fairly audibly and could swallow without great discomfort. Most of the pain from now on was due to ulcerations on either side of the tongue, caused by pressure against lower right and left carious molars.

From this time until the patient left the hospital, a period of two weeks, the treatment consisted of cold applications to the tongue and applications of argyrol in 25 per cent. solution, to the ulcerated areas. After leaving the hospital the patient gained strength rapidly and on Jan. 3, 1911, was pronounced entirely well. He was treated by Dr. J. S. Myer for his acute nephritis, from which he also recovered.

537 North Grand Avenue.

ABSTRACT OF DISCUSSION

DR. GORDON NEW, Rochester, Minn.: About three weeks ago I saw a case almost as extensive as this, following an abscess at the root of a third molar tooth. The patient recovered, however, after drainage in the submaxillary region. Other than this I believe there is nothing to record about the case.

DR. F. B. MOOREHEAD, Chicago: It is difficult at times, if not impossible, to make a differential diagnosis between parenchymatous and interstitial inflammatory conditions excepting, of course, microscopically. A boy of 17 was sent to us with a history of acute abscess from the lower incisor tooth. The tooth had been extracted some ten days previously, and following the extraction an extensive swelling had developed, more in the floor of the mouth than in the tongue, which had the appearance of a typical Ludwig's angina. The swelling went backward and the patient had difficulty in swallowing; the tongue began to enlarge and completely filled the mouth. The swelling in the lower part of the mouth and tongue made tracheotomy necessary. The pain was very severe, temperature 102.

DR. THEODORE BLUM, New York: What was the infection from which this came?

DR. MOOREHEAD: A simple alveolar abscess, I imagine. I did not see the case until the original focus had cleared up, the patient coming to me with a mass of induration on the floor of the mouth.

DR. BLUM: Was a roentgenogram taken?

DR. MOOREHEAD: Yes, but it showed nothing except the empty socket from which the tooth had been removed. There was no other bone involvement.

DR. M. I. SCHAMBERG, New York: The cases of glossitis that we come in contact with are usually secondary to other disturbances, as stated by Dr. Moorehead. The description of the case which Dr. Moorehead has given us is identical with a case which recently came under my care, in which the suppurative site was in the submaxillary region and had extended to the tongue, so that the tongue showed a certain amount of the extension of the inflammation. Another patient was sent to me as a case of glossitis showing evidence of swelling in the tongue in which the physician in charge suspected a specific origin. The history of the case as obtained from the patient showed no history of an initial lesion. The patient was married, his wife had borne several children and there had been no miscarriages. On examination I determined, with some difficulty, a slight ulcerated spot on the lateral aspect of the tongue in relation with two or three molar teeth. This they attempted to explain because of the swollen tongue coming in contact with roughened teeth. I was, however, suspicious that the case was malignant and took a fairly good section from that portion of the tongue and sent it to one of the best pathologists in New York. The report came back that it was not malignant. In spite of this I persisted in the view that it was malignant and that we had not reached the tissue showing the typical pathologic changes. The case passed out of my hands at that time because the physician called in some one else for a Wassermann. A positive Wassermann was found and the case was treated with salvarsan. There was an improvement, and I was also informed subsequently that the lesion that was removed from the tongue was malignant. It is important in these carcinomas of the tongue to remember that they are often deep seated and that the removal of superficial tissue will not determine it. I thought I had gone well into this ulcerated region and that I had obtained some of the involved tissue, but the diagnosis was made absolute by the pathologic finding after the removal of the tongue.

These tongue cases are exceedingly malignant and the only salvation is to see them as early as possible. In another case there was a slight ulceration on the side of the tongue which attracted attention. The patient was sent to a physician who diagnosed it as an initial lesion of syphilis and treated the patient for chancre. When the patient came to me the tongue was well indurated beyond the median line. I advocated the removal of the tongue, but the patient would not consent to the operation and went to an untimely death six months later. The only chance in these cases is to make an early diagnosis and they should be looked on with grave suspicion, particularly cases of glossitis that do not show suppurative lesions or in which the blood-count does not indicate the presence of disease in the system.

DR. A. H. LEVINGS, Milwaukee, Wis: So far as my experience goes, practically all of these cases are due to infection. It may be either streptococcic or staphylococcic. The point of infection we may not be able to determine, but it is usually some scratch or abrasion as from a roughened tooth, or it may be the sting of an insect. I have never seen a case of parenchymatous glossitis that I thought I could not differentiate from carcinoma. Dr. Loeb's treatment of the case I think was excellent; either make numerous punctures or make a free incision, the idea being to deplete the tissues, cause free hemorrhage, and get rid of the infection.

DR. VIRGIL LOEB, St. Louis: I had intended to make a deep incision, but finding no pus present and getting satisfactory results by aspiration, there was no occasion for such a procedure. In differentiating from any malignant disease of the tongue, I examined the patient thoroughly before the swelling developed and there was no sign of induration.

Public Health and Personal Hygiene.—Public health is made up of units, personal health is public health, personal hygiene is public hygiene. If perfect health on the part of the farmer is considered, he will not allow milk to be dirty, allow pollution to get into the well or brook or stream. If you are working for public health you are working for personal hygiene, individual, clean, sanitary living and if each individual would follow that out public-health problems would be largely solved. Health doctors to be successful must expect to train the individuals they come in contact with in the laws of personal hygiene.—W. H. Sawyer, *Journal Michigan State Medical Society.*

A STUDY OF THE BACTERIOLOGY OF ALVEOLAR ABSCESS AND INFECTED ROOT CANALS*

THOMAS L. GILMER, M.D., AND A. M. MOODY
CHICAGO

Since Billings, Rosenow and other internists have found the mouth a prolific primary focus of infection, fraught with secondary manifestations of grave consequence, it has been thought desirable that a closer study of the bacteriology of alveolar abscess, both acute and chronic, as well as the infectious material found in pulp chambers and root canals, should be made.

The impression generally entertained that alveolar abscess, both acute and chronic, is due to the *Staphylococcus albus* and *aureus*, seems from our study not well founded. We have received this accredited opinion, not from written statements, but from questions put to those whom we knew had had such experience in the observation and treatment of alveolar abscess, and their answers have been expressed as before indicated.

One looks in vain for statements in books which treat of alveolar abscess of opinions on the bacteriology of this disease. The subject has been thought either of too small consequence to warrant discussion, or too difficult of solution. We recognize that abscesses of the jaws are by no means the only mouth conditions to which joint, heart and other lesions may be attributed, but we have made our study of the bacteriology of tooth infections partly because so little attention has been given it and because we were able to gather from such foci specimens with less liability of contamination, than from pyorrhea alveolaris pockets, for instance. The mouth, even in health, affords a great flora, both of pathogenic and non-pathogenic bacteria, therefore great care and painstaking was necessary in the collection of material which would be uncontaminated.

In gathering specimens from acute alveolar abscess the field to be incised was made as nearly aseptic as possible by thorough washing with 50 per cent. alcohol, and as soon as the incision was made a sterile pipet was introduced deeply into the abscess and the pus collected. The pipet was then sealed and sent to the laboratory.

In the chronic infections, abscesses without sinuses were selected and similar precautions observed for the collection of specimens. In others, the pus was collected direct from the pulp canals of teeth having no cavities of decay; the tooth being thoroughly washed with alcohol after the application of the rubber dam, then drilled through into the pulp chamber with a drill, and as the pus welled up from the canals it was received in the pipet. In others, the pus was collected from the apices of freshly extracted teeth which had been removed under careful aseptic precautions. The specimens from septic root-canals were gathered from teeth recently removed. In order to expose the root-canals the teeth were enveloped in sterile gauze and placed between the jaws of a vise and crushed, others were flamed and the roots then split with sterile bone-cutting forceps. These methods exposed the pulp-chambers and root-canals from which the specimens were obtained. In some of the teeth thus examined there was found pulp-tissue partly gangrenous and partly alive, in others only necrotic elements of the pulp, the pulps in some having been dead for a long period of time, as indicated by the presence of old imperfect root-canal fillings.

The presence of bacteria of various kinds within the structures of the teeth and the tissues adjacent to them was demonstrated many years ago by Miller (Micro-organisms of the Human Mouth) and others. From our work it would seem that we are now able to classify the more important organisms which correspond in many respects to descriptions and photomicrographs of bacteria of the dental structures appearing in the literature as early as 1881. Our conclusions are arrived at from some forty odd bacteriologic examinations, which it has been our privilege to make of material from acute, subacute and chronic or latent infections of the jaw and teeth. There were sixteen acute alveolar abscesses, eighteen subacute or chronic abscesses and eight teeth with diseased root-canals from which material was received for bacteriologic examination.

In the main there has been a great similarity in the results obtained. We believe that to obtain such constant results as we have, the same technic should be employed. That technic is the following:

After receiving the material to be examined, collected in the manner described above, it is smeared on the surface of blood-agar or ascites-dextrose-agar slants. One tube is placed under anaerobic conditions by the addition of pyrogallic acid and a few drops of sodium hydroxid to the tube after the cotton plug has been pushed in about one-third the distance from the top. The tube is then plugged with a plain cork and sealed with paraffin. The other inoculated tube is kept under aerobic conditions and both are placed in the incubator at 37 C. (98.6 F.).

Within twenty-four hours one will usually see a fine granular growth over the surface of the aerobic blood-agar slant. If one examines this closer the growth is seen as fine greenish colonies. The water of condensation contains chains of these organisms which are usually Gram-positive. There may also be a similar growth in the anaerobic tube but one cannot distinguish the green color. At the end of forty-eight hours, however, there is quite a change in the appearance of the anaerobic growth; it is very luxuriant, grayish-white in color and the colonies have a great tendency to fuse. On opening this tube one notices immediately a very offensive odor.

The above hurried gross description of the cultures will hold for the great majority of the specimens from the chronic infections examined. The variations are due to the predominance of one or other of the principal organisms present, and to whether or not the material cultured has been contaminated with unimportant bacteria from the mouth. The bacteriologic results in our series of acute abscesses differed mainly in the aerobic findings. In these there were varying degrees of hemolysis of the blood.

From the microscopic examination for further identification of the organisms in question, we found the predominating organism to be a streptococcus. We have obtained many graded variations from a hemolytic streptococcus with a wide zone of hemolysis in the acute abscesses, to a *Streptococcus viridans* in the

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* From the Laboratory of St. Luke's Hospital.

chronic, and just recently one in which a *Streptococcus mucosus* was the predominating organism. These organisms, particularly the green-producing streptococci will in many instances grow as well anaerobically as they will aerobically.

The anaerobic cultures which do contain streptococci are rarely pure. Some contain *Bacillus fusiformis* in varying numbers. A few of these tubes, however, have practically pure cultures of fusiform bacilli.

The above results are what we have learned to expect, but there are many other organisms which occur with these. Aerobically we occasionally obtained isolated colonies of *Staphylococcus aureus* or *albus, Micrococcus catarrhalis,* and some unidentified saprophytic organisms. In two instances a diphtheroid bacillus has been found which grows under both aerobic and anaerobic conditions.

Anaerobically, in old cultures, we have seen in material from three different abscesses a black pigment-producing organism. This organism is slow growing and does not usually appear for about five days. We do not believe that it is of any importance in these infections.

In three of the chronic cases from which material was examined the patients were treated with autogenous vaccines with strikingly beneficial results. The vaccines were made from the cultures of both the aerobic and anaerobic organisms, and were given in graded doses at five-day intervals.

These were chronic suppurations, following that class of acute infections of the mandible characterized by much brawny swelling, persisting over a week or more with little or no indications of pointing. The pus discharge continued with no seeming diminution for several weeks after the acute symptoms had subsided. In each instance the pus flow stopped promptly on the use of the vaccine treatment.

Those who have made extensive observations of the tendency of acute attacks of alveolar abscess recognize that they occur epidemically. Whether the epidemics of streptococcus nose and throat infections follow or occur simultaneously with epidemics of alveolar abscess is a question both of interest and importance. We have not sufficient data to warrant a definite statement relative to the subject, however, since we have found in both infections the same bacteria; and as both occur epidemically it may be discovered that there is a very definite relationship between the two infections.

It seems reasonable to suppose that the presence of the streptococcus of nose and throat infections may easily cause simultaneous or secondary infections in the jaws, the organisms reaching the apices of the roots through cavities of decay in the teeth, or through the circulatory channels.

Since the discovery of a positive relationship between tonsil infections and secondary manifestations in other organs and parts, tonsils have been removed wholesale, in some instances on slight provocation. Their removal has, we fear, become with some almost a fad. A similar fad is growing up relative to the removal of teeth, since the discovery that jaw abscesses and pyorrhea alveolaris are equally as potent foci for secondary infections as are the tonsils. Some physicians are rather indiscriminately sending their patients to the extraction specialist, requiring removal of several or all of the teeth, supposing them to be a factor in some lesion, when their removal is not always justified. A roentgenogram, if properly made, is infallible, and can be absolutely relied on providing its interpretation is correct, but an improper exposure may lead one, if inexperienced, to mistake a part of the maxillary sinus for an abscess at the end of the roots of the second bicuspid or first molar. Other errors from incorrect readings may lead to similar wrong conclusions.

Some jaw abscesses may be cured by treatment through the tooth's root, still others by surgical interference, other than by extraction. Pus appearing at the free margins of the gums does not always indicate the so-called pyorrhea alveolaris. It may be due to lime deposits, the removal of which permits a speedy return of the gums to health. The diagnosis of this class of pathologic conditions of the mouth requires special study and an educated technic.

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MOUTH INFECTION AS A SOURCE OF SYSTEMIC DISEASE*

FRANK BILLINGS, M.D.

CHICAGO

The subject assigned is "Mouth Infection as a Source of Systemic Disease." I shall confine my remarks to infection of the jaws (alveolar infection) as related to systemic disease. Many radiographic films of the jaws have been made from patients in our clinic at Rush Medical College and the Presbyterian Hospital suffering from chronic arthritis. One film shows an alveolar abscess occurring in a patient with Hodgkin's disease. These films as a means of recognition of alveolar infection are not new to members of this section, but this method of examination of alveolar disease is not sufficiently utilized by dentists and physicians generally. It should be used, for by no other method may one know the exact condition of the alveoli and roots of the teeth. Alveolar infection and abscesses may be primary and due to unhygienic conditions of the mouth and I am sure it is often intensified and prolonged by irrational dentistry—teeth with infected pulp crowned or improperly filled. General malnutrition (scurvy, etc.) may cause mouth infection and alveolar disease. But whether primary or secondary, alveolar focal infection may be the dominant factor in the production of systemic disease, of which malignant endocarditis (*Streptococcus viridans*), chronic arthritis and myositis are examples. From the infected alveoli and tooth canals we have made bacterial cultures. The dominant organisms belong to the streptococcus-pneumococcus group. I would refer you to the brilliant results of the investigation of our colaborer, Dr. E. C. Rosenow, on the mutation of cultural and pathogenic characteristics of this group of bacteria. In addition staphylococci, a fusiform bacillus, the *Bacillus aerogenes capsulatus,* and various saprophytic organisms are found. The streptococcus-pneumococcus group apparently comprise the important pathogenic bacteria related to systemic disease. In five patients suffering from Hodgkin's disease, an alveolar abscess has culturally yielded the diphtheroid bacillus, which is found in the enlarged lymph-glands

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in that disease. We also know that systemic actinomycosis may arise from alveolar infection due to the ray fungus.

Systemic disease due to a focus of infection anywhere, is probably always hematogenous. The study of the infected tissues of experimentally inoculated animals and the infected muscles, joint tissues, lymph-nodes proximal to infected joints, nodes on tendons, etc., of patients, yield specific bacteria, and histologically there is found embolism of the small and terminal blood-vessels. Local hemorrhage and endo-arterial proliferation result in interstitial overgrowth, cartilaginous, osseous, vegetative and other morbid anatomical changes, dependent on the character of the tissue infected.

Partial or complete ischemia of the tissues due to the embolism is an important factor in the production of the morbid anatomic changes. Oxhausen of Berlin has produced, in animals, aseptic osteochondritis resembling arthritis deformans, by ligating the arteries supplying the joint tissues. These principles are, I think, susceptible of proof, that a chronic alveolar infection, and chronic foci in other regions also, may cause systemic disease by hematogenous bacterial emboli, which infect and at the same time deprive the tissues of nourishment. Local infection of muscles, joint tissues, etc., and lessened blood-supply result in the peculiar morbid anatomy of the respective tissues.

To investigate and manage these patients requires team work of the clinical and laboratory workers. The clinician must carefully examine the patient, exhausting every detail in the personal history. The skill of the dentist, the nose and throat specialist, the gynecologist, the genito-urinary expert and others may be necessary to locate the foci of infection. The focus must be destroyed. Tissues and exudates of foci should be carefully examined and bacterial cultures made. Vaccines of the dominant bacteria may be made for subsequent use.

With the source of the infection removed, the attempt should be made to increase the defenses of the body against the systemic infection. This involves a long and tedious period in the chronic joint infections and also in some other systemic diseases of focal origin. Rest, both mental and physical, is essential. Good, wholesome food, pure air, optimistic surroundings and, if necessary, restorative tonics of iron and other drugs. Pain must be palliated by simple drugs like the salicylates. After a time passive exercise and later active graduated exercise must be followed to aid in the restoration of local circulation and to hasten restoration of the morbid changes of the tissues. Autogenous vaccines may be used in the attempt to improve the defenses of the body. In chronic arthritis, with the circulation of the infected tissues obstructed embolically, antibodies in the blood stream, even if augmented by vaccines, would have but little effect locally. In the later stages of chronic arthritis when the local circulation has been so improved that the tissues are flooded with blood, vaccines will be of undoubted value. Patients may, however, be cured of chronic arthritis by the other measures named without the use of vaccines.

To recognize the character of this class of systemic disease and to manage successfully the patient, the physician must have absolute control. This implies hospital care where team work of the staff may insure qualified clinical and laboratory workers.

MOUTH INFECTION AS A SOURCE OF SYSTEMIC DISEASE *

C. H. MAYO, M.D.
ROCHESTER, MINN.

It has taken a long time for the general public to appreciate the full rôle of infection in the production of death, while even in the medical profession, more has come from the study of infections in the prevention of disease than in increasing the means of cure of disease, great as have been the results of treatment.

Since all animal life depends on some other form of cell life, vegetable or animal, it seems but the part of all life to carry on this process of germinative development and maturity. It is only the resistance of healthy cells that prevents the inroads of the myriads of ever-present bacteria and animal parasites which are striving to get a foothold that they may in turn carry on their life work. Disease, then, is an inflammatory process from infection and the efforts at repair. It may also be chronic from the failure of cell life through lack of defense, from defective nutrition and advancing age.

We still speak more or less lightly of the so-called diseases of childhood, and the time is not far past when mothers took their children to be exposed to whooping cough, mumps, etc. To-day the intelligent woman knows that it is not necessary that the vitality of the child should be jeopardized by such preventable diseases, and that when they occur it is through carelessness, neglect or ignorance on the part of some one.

A comparatively small number of infections occur through wounds of the cutaneous surface. Many of those affecting the special organs are incurred through direct or indirect contact, as those of the eye and of the genito-urinary system. They may make most serious inroads on the general health. Infections which produce the greatest number of diseases enter the system by way of the alimentary and respiratory tracts. Somewhere in the line, then, of the alimentary and respiratory tracts and in the excretory ducts of the body lie the sources of the entrance of organisms which terminate life in the majority of instances. The great importance of the well-known diseases of the nasal passages with their sinuses, the lymphoid tissue of the pharynx, including the tonsils, and the diseases of gums and teeth, which have been given prominence by the dental profession during the last three years, is now more generally appreciated.

The mouth is the harbor of many varieties of bacteria which are constantly taken into the stomach during the process of eating. We have long looked on the acids of the stomach as destructive to such bacteria, but Smithies, in a microscopic examination of gastric extracts from 2,406 different individuals with "stomach complaint" (dyspepsia, indigestion and the like), showed that irrespective of the degree of acidity of such gastric extracts, bacteria were present in 87 per cent. Morphologically cocci and diplococci were present in 83 per cent.; short and long rods (often of the colon group) in 58 per cent.; typical streptococci and staphylococci in 17 per cent. and *Leptothrix buccalis* in 24 per cent. In fifty-four cultural studies of saliva from "dyspeptic" patients, streptococci and staphylococci were demonstrated in over 80 per cent., bacilli in 66 per cent. and *Leptothrix*

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buccalis in more than 14 per cent. Comparing these figures, it would appear that the common forms of pus-producing organisms (streptococci and staphylococci) have their proliferation retarded in gastric juice, but that bacilli (often of the colon group) as well as *Leptothrix buccalis* thrive in the stomach.

Bacteria of various forms live in the small intestine, or at least pass through it or into the blood stream by way of the mucous membrane. They exist in such great numbers in the large bowel that, whether living or dead, they constitute a considerable bulk of the dejecta. During the last few years some important points have been added to our knowledge of bacteria. Living germ life in the blood, or bacteremia, occurs in all infectious diseases. According to their number and virulence, the blood responds in slight or extreme degree to the symptoms, general and local, constituting the disease.

We have long known that bacteria were specified in type and action in all diseases in which we have been able to identify a specific germ. Rosenow has done a great work in showing that changes in environment may so change bacteria that specific action varies. The appearance of the bacteria is also unlike that of the original cell. In the blood stream these various forms, once they enter it, are selective in choosing their location, thereby developing specific local disease. The old "idiopathic" osteomyelitis of the child we now know may follow a short time after a specific tonsillitis. Pyorrhea, tonsillitis or sinus disease may be the source of an infection which we call rheumatism. Root abscesses and pus pockets connecting with them are often the source of acute and chronic rheumatism. The nasal sinuses and chronic mouth and throat infections develop anaphylaxis from the constant poisoning, and their results are shown in hay fevers, asthmas, urticarias, etc. Rosenow's work is going far to show that ulcerations of the stomach are conditions in which the mucosa is attacked from behind through the blood stream by bacteria which live in the blood and have a selective affinity for these particular areas. Septic bile which, in the majority of instances, is caused by infection is carried to the liver through the portal circulation. It creates such changes in the bile that it fails to activate the pancreatic and duodenal secretion, thus making various phases of indigestion, with qualitative rather than quantitative food trouble. Lower down we have the appendix with its lymphoid tissue which approximates in character that of the tonsil. Here the acid types of bacteria have the same opportunity, could they but enter the blood stream, of making erosions of the gastric mucosa as the specific form which is found in the mouth. We may here note that acid-secreting or acid-bathed surfaces are very subject to cancerous change, while alkaline-bathed surfaces are much less liable to be involved. Saliva is neutral or slightly alkaline in health, yet less than 20 per cent. of people have healthy mouths. The infected mouth shows a tendency to the acid reaction and it is through this acid change that we have an additional danger in cell degeneration, of malignant type, from chronic irritation.

The stomach is the most common location of all cancers, while the alkaline small intestine is rarely subject to cancer and the duodenum is most resistant to it. The large bowel again reverts to an acid reaction and is very subject to cancer. So also is the bladder. These structures with acid secretion are of more recent development than are many tissues of animal life, several of them being classed as organs of convenience, which fact renders them possibly less resistant.

Certainly enough is known concerning infections and their mode of entrance, that the infected and diseased mouth and respiratory tract must be looked on as most serious menaces. Much may be done by more general and effective school inspection. The present generation of children will understand and demand protection for their children in time. The first teeth should be watched, that the second be not permitted to erupt irregularly, causing deformities. Jaws should be spread that the teeth may meet and the high arched palate, diminishing nasal breathing, thereby reduced. Tonsils and adenoids should be looked after, thus preventing ear and mastoid diseases, rheumatism, endocarditis, etc. In chronic and recurring diseases, a search must be made to establish positively the nonparticipation of each of the several sources of infection.

The physicians engaged in this line of observation require fully as much training in the rudiments of dentistry as the dentist does in the signs of infectious diseases. While we have leaders in all professions, through the energy of their kinetic glands, the big stick which leads to our advancement is in the hands of the progressive and educated public who are constantly demanding more of their dentists, of the medical profession, and of the state in protecting them against preventable diseases.

MOUTH INFECTION AS A SOURCE OF SYSTEMIC DISEASE *

E. C. ROSENOW, M.D.
CHICAGO

Cultures from emulsified tissues in various systemic disorders, such as the adjacent lymphatic glands draining the involved joints in arthritis deformans, in acute articular rheumatism, and the lymph-glands in Hodgkin's disease, have yielded interesting results. One striking thing in connection with some of the more chronic infections is that the character of the micro-organisms found in the lesion may be quite different from the character of the micro-organisms in the focus of infection at the same time. This, however, does not minimize the importance of the focus of infection in any way. The organisms found in the tissues may have undergone change. This fact should be borne in mind whenever autogenous vaccines are to be used. The poor results in some cases of arthritis, for example, following the use of autogenous vaccines prepared from the tonsils or other presumable focus, may be due to the fact that the organisms present in the focus at the particular time when the cultures were made were not like those actually infecting the tissues. And if so, the vaccine would fail to contain the proper antigen.

While the most common location of the focus in various infections is probably in the head, and hence the great opportunity for you, it may be located elsewhere. Thus in two cases of typical rheumatism we succeeded in isolating the *Streptococcus rheumaticus* from the stool; in one from an infected ingrowing

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toe-nail, and in another case from the wound in the thumb following a crushing injury.

The abscesses or bony changes found about the roots of teeth in various systemic diseases, especially in cases of chronic arthritis, may or may not be primary, but if found the condition should be corrected, because vaccine or other treatment largely fails so long as there exists an active focus of infection, as shown, particularly by Billings. My study on the effect of varying degrees of oxygen tension on the members of the streptococcus group, together with other facts, makes it likely that it is in the focus of infection that changes in virulence occur and the different affinities for various structures are acquired. In other words, the focus of infection is to be looked on not only as the place of entrance of the bacteria, but also the place where the organisms acquire the peculiar property necessary to infect. In the light of our present knowledge the argument that infections in the mouth are so common in individuals in apparent health, does not minimize their importance. These or other foci are so common in patients suffering from arthritis, neuritis, appendicitis, ulcer of the stomach and cholecystitis, goiter, etc., and so rare in individuals who have had superb health for years, that their direct etiologic rôle can scarcely be questioned.

Regarding autogenous vaccines, our ideas need to be revised somewhat in view of the fact that the vaccines administered are usually prepared from streptococci in the focus and which may or may not be the causative organism. The instances in which good results are obtained are probably those in which the focus harbored the causative organism and the vaccine prepared from it. The instances in which poor results are obtained may be due to the fact that the vaccine does not contain the proper antigen.

With regard to the foci: What are they, where are they, and what organisms are usually present? Probably the most common location of the focus or source of infection is the mouth. The tooth socket has a structure similar to that of the joints, and a blind abscess at the apex of a tooth may have no more significance than the lesion in the joint. While it is proper to remove the teeth that are abscessed in a case of that kind, we should not expect that that is necessarily the source of the trouble, but must look still further.

In connection with acute infections, the acute arthritis that we see in rheumatism, a few cases may be of interest. In the first case the patient had gone through the search for foci of infection; his tonsils had been removed, the teeth examined, and a thorough physical examination made. The patient had had repeated attacks of rheumatism which continued for years, and usually occurred in the fall. He came to me in the midst of one of these attacks and on examination I was unable to find any focus of infection that would account for the trouble. This particular attack followed some intestinal disturbance. On three occasions I was able to isolate from the intestinal tract a streptococcus which when injected into animals produced rheumatism. This attack cleared up and I immunized the patient for a long time with the vaccine prepared from the streptococcus from his stool in the hope that some unknown focus in the intestinal tract might clear up.

This patient went south, and while in the South he had some trouble with his teeth. He saw a dentist and the dentist happened to be a man who knew something about the work that Dr. Morehead and Dr. Gilmer are doing in regard to the teeth, and he found an abscessed tooth and pockets of pyorrhea. When he came back I examined the mouth carefully and found no evidence of infection until along the surface of the gums I raised the tissues and found pus pockets. There was not even inflammation on the surfaces, but with a probe I obtained pus from the pockets around the teeth from which I made a culture and produced rheumatism in an animal. The pyorrhea probably had existed for years. This illustrates how difficult it is to locate the focus.

Another case in which the focus of infection was entirely overlooked was that of a young lad who had an acute attack of rheumatism with endocarditis and pericarditis so serious that it was thought he would die. I was asked to see the patient, with some idea, I think, of giving a vaccine. On examination I found that the boy's thumb had been crushed off in an accident ten days before the rheumatism began. I obtained from a necrotic area remaining a culture of a streptococcus like that of rheumatism, and when injected into animals it produced rheumatism readily.

It will be seen that the question of the focus of infection is a matter not only for the stomatologist or the dentist, but for the general practitioner, the surgeon; every branch of medicine needs to be taken into consideration to run the matter down and find the focus from which the organism gains entrance to the body.

PERIDENTAL INFECTION AS A CAUSATIVE FACTOR IN NERVOUS DISEASES *

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The presence of pus in a body cavity has long been considered a finding of the utmost importance, of even grave significance, to which an almost innumerable number of symptoms may be attributed. Until recently, however, the existence of pus around the teeth has been lightly regarded and often rejected as a possible cause of serious systematic disorder. The delay in appreciation of the importance of the presence of infection about the teeth is, doubtless, largely due to the familiarity of the physician with the condition in patients whose symptoms seem too remote from the mouth to have any connection with it. Then, too, it cannot be denied that there are persons suffering from pyorrhea alveolaris in whom it has remained a purely local process.

The results of peridental infection would certainly be more disastrous were it not for two fortunate factors of safety, the one, anatomic, the other physiologic. The former is the fact that the pus usually has free drainage into the mouth. The latter factor is the establishment by the body tissues of various degrees of immunity against a continuous bacterial intoxication, for example, from *Bacillus coli communis*. Just as the colon bacillus sometimes overpowers the individual's resistance and produces a general intoxication, a localized collection of pus or septicemia, so may the bacterial flora of the mouth subdue the body resistance

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and originate an abscess, produce a general intoxication, or entering the blood-stream, may establish a new center of growth in another region of the body.

We may well ask is the alveolar pus pocket the depot of origin of brain abscess in those cases the origin of which has been unexplained, in which there has been no abrasion of the skin and no aural or mastoid infection? A purulent process in the posterior urethra, in the vagina or in the tonsil is considered ample source for any arthritis, neuritis or endocarditis which may subsequently develop. Are we not then justified in considering a septic condition around the teeth a source of various disturbed states of health, no other cause existing? Especially is this probable when the correction of the local oral condition is followed by alleviation of the general symptoms. The proof of the responsibility of oral sepsis for certain diseases of the nervous system rests on no other evidence than that just expressed — when the dental condition is corrected the manifestation of disturbance in the nervous system disappears.

Peridental infection is by no means limited to the clinic patient, it is often found in those who have taken the utmost care of their teeth. In these cases the dental work has been faulty and the real status is only revealed by a roentgenogram of the jaw. Crowns and bridge-work are peculiarly liable to have incarcerated pockets of pus.

There seems to be no portion of the nervous system for which the subtle toxin of peridental infection has a predilection. Probably the most common symptom is paresthesia in the fingers and toes—a "pins and needles" sensation—a symptom common to other chronic intoxications. For a considerable period it has been observed that a bad condition of the teeth may be responsible for adjacent disorders, such as otalgia and tic douloureux, but the observation that stubborn neuritis of the sciatic or other nerve trunk or of the brachial plexus sometimes disappears after cleaning out the alveolar disease is of comparatively recent date. The continual swallowing and absorption of pus is undoubtedly the cause of disorders of digestion, headache and finally an anemic condition almost cachectic. This depleted, exhausted state may often be associated with a melancholic state. It seems a far cry from mouth infection to mental disease, but when one witnesses profound depression clear up following the drainage of several alveolar pus-pockets, one is persuaded that the chronic intoxication, the result of absorption from the pent-up infectious process, was an etiologic factor.

Cases of pachymeningitis within the cranium have been attributed by reliable men to peridental infection. Doubtless, also, the peridental membrane has been the portal of entry for infection, causing various forms of arthritis the etiology of which has been obscure. From a variety of disorders the result of peridental infection I have selected four of diverse character whose improvement, following a cleaning up of the dental condition, was rather striking.

Case 1.—Cardiac arhythmia associated with angina: The patient, a surveyor, aged 46, married, temperate in the use of stimulants and tobacco, began to be annoyed in August, 1912, with thumping of his heart at night. These attacks would awaken him out of a sound sleep, would last a few minutes and disappear. At first they occurred about every fortnight, but by December, 1912, the attacks of cardiac thumping were not only occurring every twenty-four hours, but were occurring in the daytime as well as at night.

In addition to the disagreeable pounding of the heart, pain had appeared. The pain at first crossed to the right side of the chest, but later into the left axilla and up the back of the head. This was accompanied by a feeling of anxiety and dread and compulsory immobility. In one attack consciousness almost failed. The only other illnesses the patient had ever had were lead poisoning in 1898 and "typhoid-pneumonia" in 1899. From these he had recovered completely and had enjoyed excellent health until this present illness. Syphilis was denied and the Wassermann reaction was negative. Neither clinically nor by Roentgen ray could anything pathologic be demonstrated in the mediastinum. The heart was of normal size and location. Accompanying the systolic sound was a subdued blowing murmur, and the pulmonic second sound was slightly accentuated. When not in an attack his pulse was regular and rhythmic, 70 per minute, and the systolic blood-pressure was 125 mm. Hg. He exhibited a coarse static manual tremor said to be familial. Examination of the blood, urine and gastric contents revealed nothing abnormal. A slight pyorrhea about the teeth was noticed but was thought insufficient to cause such grave symptoms. He was put on general hygienic and tonic measures and discharged. I was not fortunate enough to see him in an attack. Three months later the patient returned having made very little improvement. Roentgenograms of the jaws were then made and disclosed no less than three pockets of pus about the roots of the teeth. These were opened, drained and treated, and since that time, a period of practically six months, he has been entirely free from cardiac palpitation and its associated angina. Quite recently he writes, "I haven't had a shadow of trouble in the region of my heart."

Case 2.—Persistent periarthritis: A man, aged 46, of good health and temperate habits, free from venereal infection, developed two years previously moderate swelling of the tissues around the middle joint of the right finger. It became painful on movement and any trauma made it worse. Use of the joint, for example, playing golf, also aggravated it, but cessation of vigorous use didn't cure it. He had never been a sufferer from sore throat and was not otherwise rheumatic. He took the "cures" at Aix-le-Bains and Carlsbad without noticeable benefit to the joint. In February, 1914, he noticed some tenderness of a premolar tooth. Examination revealed a slight discharge of pus from the adjacent gum. The tooth was drawn and found to be abscessed at the root. Within a fortnight the periarthritis began to disappear and two months later there was no trace of it.

Case 3.—The commonest symptoms following absorption from peridental infection: A woman, aged 54, complained of "pins and needles" sensation in her hands and feet, pain and tenderness in the muscles of the back and calves, and considerable mental irritability. On examination she was found to be fairly well preserved for her years. Her heart was slightly enlarged in both diameters; pulse 84; blood-pressure 120; auscultation negative. In all the muscles of the back, particularly those above the spine of the scapula, were points tender on pressure; also various points in the intercostal spaces were tender on pressure, especially the left border of cardiac dulness. Squeezing the muscles of the arms and calves caused considerable pain. There was no definite nerve-trunk tenderness. Besides this the physical examination showed nothing of significance except a profound pyorrhea alveolaris.

After a week of eliminative and tonic measures, during which no improvement was evident, she was advised to have the dental condition remedied. A dentist extracted several carious roots and cleaned up the pyorrhea around the better preserved teeth. Within two weeks her gums looked comparatively healthy. Coincident with the improvement in her oral condition the tender points in her muscles and the paresthesia in the hands and feet diminished. Eliminative methods were continued for another three weeks, at the end of which time her muscles were in a comparatively normal state.

Case 4.—Presenting a picture of an agitated depression in which the presence of alveolar pyorrhea of long standing was

evidently an important exciting factor, but not, perhaps, the primary cause:

The patient, a woman, aged 59, well preserved and of more than average mentality. She sprang from a long-lived nonnervous stock; she had passed through the climacterian twelve years before without unusual disturbance. During the past three years she had sustained a series of shocks with great fortitude and for the time being without telling effect on her nervous system. Three years previous she lost her father, a year later her mother died. During the week of her mother's death she had had a nasal operation performed. Soon after this, financial losses occurred which were the cause of considerable worry. The patient continued in reasonably good health for over a year, that is, until six months previous to entering the hospital. At that time she went to a fashionable sanatorium, more as a pleasure resort than for treatment. While there she began to have attacks of dizziness. A physician told her she was suffering from mild heart-disease and prescribed Nauheim baths. After she had taken eleven baths the present "nervous breakdown" began.

When first seen the patient was greatly depressed and nearly always in a state of agitation, pacing the floor restlessly and recalling the loss of her mother as the greatest disaster in her life and weeping bitterly during every conversation. She said she was convinced she would not recover. At other times she spoke in a mournful tone without being able to give the exact cause of her depression.

Physical examination was entirely negative, except for a pulse of 100 and the condition of her teeth. Heart was of normal size and without pathologic sound. The stool when examined proved normal, except for slight evidence of catarrhal colitis. Blood examination showed hemoglobin 78 per cent.; red blood-cells, 4,869,000; white blood-cells, 6,500; differential showed mild increase in the lymphocytes; the urine was normal. A test breakfast showed diminution in the hydrochloric acid content. A serum Wassermann was negative, and the spinal fluid was normal in every respect.

After a week of tonic measures without noticeable improvement it was decided to subject the patient to the ordeal of having her dental condition improved. A roentgenogram of the jaw showed two abscessed roots under crowned teeth and a collection of pus beneath a faulty bridge.

The bridge-work was removed and abscesses drained. During the following week the cloud began to lift, and she began to have moments of better humor and saw some possibility of looking at the brighter side of things. The patient was then sent to the country for two weeks from which she returned in a comparatively happy state of mind. She arranged to take some hydrotherapy treatment at the hospital, but a few days later decided to go visiting instead.

The message of this paper is that the obvious is too often disregarded in searching for some profound cause. The discovery of a purulent process similar to that frequently seen in the mouth in other regions of the body would be sufficient ground for the hasty summons of the surgeon. A full appreciation of the possible dangers from infection around the teeth should lead us into council with the dentist. This is in no sense a criticism of the dental profession, but rather a plea for the closer cooperation of the medical man and the dentist. After an expert dentist has properly cleaned up alveolar pyorrhea or abscess, we find vaccines, as a usual thing, unnecessary.

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ABSTRACT OF DISCUSSION OF SYMPOSIUM ON MOUTH INFECTIONS

DR. ARTHUR D. BLACK, Chicago: One phase of this subject, of interest to both dentist and physician, which has not received the consideration that it should, concerns the pathologic changes that take place in the tissues which are involved in the establishment of these foci in the mouth. We have in the mouth two groups of chronic foci, the chronic alveolar abscess and the so-called pyorrhea pocket, both of which involve a single tissue—the peridental membrane—which is the important factor in establishing the chronicity of both groups of cases. As a result of the involvement of the peridental membrane, either at the apex of the root or beginning at the gingival margin, there is a suppurative destruction of the attachment of the tissue to the cementum covering the root of the tooth. As a part of this process the cementoblasts, which overlie the surface of the cementum within the peridental membrane, are also destroyed. These are the only cells which could cause reattachment of that tissue. Soon after detachment, the fibers of the peridental membrane, which passed from the cementum of the detached area to the bone, disappear, and a little later the bone to which they were attached is absorbed. Thus all of the specialized elements necessary to the connection of root with bone are lost, and we cannot have reattachment of this tissue to the cementum of the root. This is shown very clearly by the roentgenogram in both groups of cases. Careful examination of these will show a line down the side of and close against the root, which is practically always in advance of destruction of the tissue elsewhere, showing clearly that this disease has begun at the junction of the peridental membrane and the cementum. There is a progressive involvement of peridental membrane and bone, making the whole area about a given tooth funnel-shaped. Within the past few years I have cut away the tissue forming these pockets from the roots of teeth for microscopic examination. In one case I removed the tooth, peridental membrane and a section of the alveolar process and overlying gum tissue all in one piece, and had sections made for study. These sections show that the above mentioned changes take place and that detachments are permanent. Therefore pockets remain about such teeth and the overlying tissue is subject to frequent reinfection. We should not, therefore, expect vaccines to have any more than temporary effect on the local focus, because we have a condition here in which the physiologic possibility of repair is gone. The dental treatment indicated is the elimination of the focus in the case of the alveolar abscess by resecting the denuded root end, or the extraction of the tooth. If it is a pocket alongside the root, exposed to the fluids of the mouth, the tooth must be extracted, or palliative treatment employed which will be effective against reinfections.

DR. M. I. SCHAMBERG, New York: Dr. Billings gave a clear and concise description of the mode by which infections of the mouth reach these parts, and I was disappointed that he did not, even cursorily, touch on the possibility of a septic endocarditis, and likewise of producing secondary infections about the body other than those that apply to arthritis deformans. I, with many others, have been observing these conditions for a number of years. Our findings have been largely clinical up to within possibly a year or two, since which time, through the cooperation of the laboratory and the medical diagnostician and interns, we have been able conclusively to prove that the mouth is a prolific source of primary infection, bringing about serious sequellae. It is equally important that we remember that the absence in the roentgenogram of the dark area is not essential to the conviction of a particular tooth as the cause of these secondary troubles. Only recently in a case in which we were anxious to find the bacterium producing the effect on the patient's general health, a tooth was removed which showed an incomplete root-canal filling with no apical disturbance whatever. On crushing off, under aseptic conditions, the tip of this tooth, from the putrescent material in the apical end of the canal we were able to grow a pure culture of *Streptococcus viridans*. Likewise, in a case of rheumatoid arthritis of fourteen years standing, the patient, who was unable to walk, was brought in with a history of a thorough survey of the mouth for any possible etiologic factor in that region. I finally found among the few remaining teeth a tooth that had been comfortable through all these years, but the roentgenogram showed a slight area about the end. We removed the tooth and from it produced a pure culture of *Streptococcus viridans*. In this case the history of the work done on the teeth recorded that it had been treated some sixteen years previously, which was two years prior to the

onset of her articular trouble. The technic described by Dr. Gilmer in taking the pus from the mouth is probably a satisfactory one. I have, at the Post Graduate Medical School in New York, been swabbing the gum tissue on the teeth with a strong tincture of iodin, and then by means of a sterile swab have taken the pus exuding from the fistula. The efficiency of this method is shown in a case in which we were searching for an organism. After two or three attempts we had absolutely no growth of the organism, so that in this rather filthy mouth we were enabled, through the swabbing of the parts with iodin, to bring no contamination from the mouth. In this case there was a copious discharge of pus which produced no organism whatever, though we used, of course, every medium used at present for the growth of these organisms. These observations together with those already given I am sure will encourage many of us who have not applied ourself to the study of these infections about the teeth, to cooperate more with the interns toward the eradication of these systemic diseases.

DR. W. A. PRICE, Cleveland: What is a dangerous infection of the mouth? Is the roentgenogram a reliable means of diagnosis or not? I think Dr. Gilmer used the term "invaluable" provided the roentgenogram was properly taken and interpreted. The roentgenogram is simply the recording of relative densities, and relative densities do not show infections of the cellular tissue of the bone. We may also have an infection without an area of lesser density as occurs frequently in necrotic bone. It is frequently necessary to have a roentgenogram to show an area of absorption by its lesser density, but, on the other hand, it does not follow that there is an infected condition because the roentgenogram shows an area of relative lesser density. We are confronted with this problem: Patients will present themselves to members of the dental profession with roentgenograms made by physicians with the demand that we extract everything that shows an area of resorption. If we object, what shall be our reason for not extracting? Immediately our profession must come to the point where we can answer these questions intelligently, and I know of no other way to meet the situation than to make exhaustive studies and thus obtain sufficient knowledge of these cases to establish means for their differentiation and correct diagnosis. The results of our studies so far on this phase of the subject strongly suggest that the field of pathogenic culturing may be a great deal smaller part of the area of infection than we have thus far suspected; that our active culture may be in the cellular tissue, about the apical end, or adjoining a pyorrhea pocket, and perhaps in a very limited area. Is it possible for a vaccine to be effective when we do not use instrumentation, or extraction or otherwise obliterate the focus of infection? Dr. Emerson, Dean of the Medical Department of the University of Indiana, made the statement in effect recently, that, in such a case, no vaccine ever did or would do any good. That is his point of view, and another is that established by the history of clinical cases in which no other treatment than vaccines were used and which as emphatically indicates the affirmative to some observers. We must recognize, therefore, that this is an open question, because men of such prominence and ability would not make such deductions without some good evidence; so let us attack these problems with new energy and from every angle that can add new light, for only incomplete truths contradict.

DR. F. B. MOOREHEAD, Chicago: The dentist should keep three things in mind. First, the work of Rosenow in the transmutation of the streptococcus and also the pathogenicity of the streptococcus at different grades of virulency. By animal passage he changes the affinity of the organisms for certain tissues. In this way lesions of the joints, mucosa of stomach and duodenum, heart, etc., are produced in animals. The mouth is a field in which this group is most frequently found. Secondly, when tissue changes have taken place to a certain extent there is little hope of repair. When the cartilage is destroyed the most that can be hoped for is the prevention of any further changes. Hence, the importance of the removal of these foci early, before serious tissue changes have taken place. Thirdly, the placing of the mouth in a state of health without the ruthless destruction of teeth. While it may be wrong to extract some teeth it is not so wrong as to keep some teeth in some patients' mouths. It is far better to take out teeth than to sacrifice the comfort and usefulness of the patient. One must weigh the value of the teeth over against the health and the usefulness of the patient to society; that is the problem we have to face. When teeth may be saved with safety to the patient they should, of course, be saved.

DR. JOHN S. MARSHALL, Berkeley, Cal.: Dr. Billings was the first general practitioner that I know of to appreciate the fact that suppurative conditions of the mouth might be the cause of general septic conditions of various kinds in the body. He will probably remember that as far back as 1886 he sent several children to me who had enlarged cervical glands for which he could not account, with the request that I examine these children and see if I could find any diseased conditions in their mouths. I did find molars in every one of these cases with devitalized pulps and abscesses at the root. The extraction of these teeth in a short time cleared up all the inflammation in the cervical glands. I feel that this should go on record because that was a good many years ago.

DR. V. P. BLAIR, St. Louis: Does Dr. Gilmer consider it necessary to curet and disinfect the cavity after the removal of a tooth with a septic area at the apex?

DR. G. V. I. BROWN, Milwaukee, Wis.: Dr. Billings and Dr. Rosenow have not only revolutionized the practice of dentistry, but they have revolutionized the practice of medicine, and the essential feature of the work, as Dr. Moorehead reminded us, lies in the transmutation of these micro-organisms. Our old standards are lost and we are facing entirely new conditions in the matter of technic whereby these bacteria can be studied, and that was the strong point in Dr Gilmer's paper. This question of technic is a difficult one, as everybody knows who has tried it. My friend Dr. Yates, in Milwaukee, has isolated micro-organisms in connection with Hodgkin's disease and is doing extensive work with Dr. Bunting in that direction. I have recently exhibited a patient for the purpose of calling attention to some of these features. The roentgenograms show, in the hand and finger joints and various other places, evidence of arthritis. The patient had pyorrhea and she has obviously a diseased sinus. She has been treated several times with bacterial products and we are now directing treatment to relieve the sinus, and the difficulty is to know how to do it. We believe, of course, that serum treatment in a case like that would not do that patient any good. The question of definite prevention and the necessity for further study of the efficiency of vaccine, which I think we are agreed is limited, are brought out in the papers of Drs. Billings and Gilmer.

DR. W. O. BRIDGES, Omaha, Neb.: The work of Dr. Rosenow and Dr. Billings and their coworkers in the line of the relation between the foci of infection and general disease has stimulated the medical profession the world over with reference to the determination of the foci of infection in cases that have heretofore not been looked on as anything but general disease represented by general infection. It has been my privilege in the last few weeks to come across some cases illustrative of these points that are impressive. I have studied for the last year the relationship between bacterial infection from the mouth and the serious anemias which we see—some pernicious and some secondary of a high type—and I have been struck with the influence of treatment directed toward these mouth infections. I have in mind two cases of secondary anemia in which the blood count showed fifteen hundred thousand red cells, and in which the patients had steadily gone down hill; so emaciated that they could hardly get about, and who had been through the regulation treatment for anemia with no results. Examination of the mouth indicated pyorrhea, with almost every tooth left in the mouth loose. All bad teeth were removed and mouth washes instituted and the treatment for anemia carried out. The results were perfectly astonishing. One patient, when he returned five months later for further operation, showed a blood count of four million red cells and was free from every tendency to anemia.

Another young man had gone six weeks with serious symptoms of general infection represented by chills and fevers, serious suggestion of malarial fever, but a diagnosis was made of septic endocarditis. It was impossible to find any indication or ordinary physical manifestation. We looked thoroughly for the focus of infection but found nothing except that in the throat the tonsils seemed to be unhealthy. I suggested that a throat specialist be consulted. The specialist discovered an abscess. The cavity was irrigated and the temperature went to normal in twenty-four hours; the patient had no further chills or fever and finally recovered. It has been my privilege occasionally to see lesions about the mouth which did not respond to treatment, in which cases the Wassermann test proved positive and the patient, put on salvarsan, recovered.

These cases illustrate the opinion, I think, that the mouth furnishes a large proportion of infection which we overlook. We in general practice find a large proportion of people who never saw a tooth brush; who do not know anything about the care of the mouth. If these cases were considered by the physician with reference to inspection of the mouth more generally, more patients would be referred to the dentist and have carried out mouth sanitation in the proper way.

DR. HENRY W. FRAUENTHAL, New York: We have made it a routine practice by means of a dentist connected with the institution to have all the teeth examined, and it has been remarkable to see how many chronic joint conditions are benefited by cleaning the teeth. I think one of the most common sources of infection has been in poorly built bridges and caps, work done indifferently, in cases in which infection existed. On removing the caps we find infection existing. A number of these cases have been shown in the New York Dental Clinic. A patient on my service had been treated for rheumatism in several institutions previous to admission to the hospital without any benefit whatever. Her pain was so acute that she attempted to commit suicide twice, having been informed that her condition was chronic, and would never improve, but on the contrary, would gradually grow worse. Owing to the condition of her gums, I made a diagnosis of joint condition due to septic pyorrhea alveolaris and with no other treatment but the correction of the mouth infection, as done by Dr. Harry A. Goldberg, an arthritis involving both knees, left ankle, right wrist and elbow, cleared up in ten days, and at the end of three weeks the patient was discharged cured. Her temperature varied from 98 to 102 F., with a corresponding pulse. This condition extending over a period of nine months, responded to treatment in ten days.

DR. T. W. CORWIN, Newark, N. J.: In regard to the search for the foci of infection, two points may be of interest. For instance, the appearance of the tonsils may be quite normal, but if the routine practice is adopted of making pressure on the tonsils with some instrument, frequently one will find an exudation from the crypts of matter which may be worth while investigating. Another simple procedure that I believe will prove valuable in many cases, and especially those in which there is a manifestation of anemia, is, whether it is necessary to make an observation of the temperature or not, to put the clinical thermometer under the tongue; before reading the temperature, if you will pass the end of the thermometer under your nose, frequently you will discover a fetid smell. Perhaps these two little points may be of assistance when searching for the focus of infection.

DR. W. H. MERCUR, Pittsburgh: I read a paper not long ago by Dr. Morris Manges of New York on the "Mouth as a Means of Diagnosis." I have met but few men who have read it; it is certainly most appropriate to the present discussion. In this article he shows how easy it is to examine the mouth and how hard it is to examine the stomach and other organs that we give so much attention to. In this article I think he speaks of eighteen different diseases which can be absolutely diagnosed from inspection of the mouth alone.

DR. J. A. PETTIT, Portland, Ore.: I have put on record a number of cases which have come through our service, illustrative of the salient points brought out here. Many of us have had experiences in this connection, which are similar in the gross, but vary in minor details. We are undoubtedly entering on a new era of therapeutics, medically as well as surgically. This subject is undoubtedly in the early stage of development; what the next few years will bring forth is hard to tell. Instead of bending our efforts to the relief of the ravages of infection, we are searching for the sources of infection and reaching out with the use of vaccines and other remedies to overcome them. This is the broad field of therapeutics of the coming day. Preventive medicine is gradually extending out and overshadowing the former field of materia medica and drug therapeutics. Heretofore, remedies have been applied for the relief of conditions which we are now able to prevent. In the face of all the admirable and life-saving work done by medical research and study, it is disgusting to be compelled to listen in dignified silence to the malevolence of ignorance displayed by various cults, and at the same time observe them taking advantage of the very life-saving procedures which the medical profession has discovered and devised.

DR. FRANK BILLINGS, Chicago: In my address I did not go into the details of every variety of disease that seems to be related to focal infection, but rather tried to give the principles of it. I think we should not use the word "cause" too much in relation to the focus of infection of a systemic disease. We should not, even with the focus before us, say that that focus is the absolute cause. I think we will have to use the expression that it is the predominating etiologic factor because there are so many other factors to be taken into account. None of us, it does not matter what our position in the profession may be, is capable of passing judgment on all things, and for that reason we have at the Rush Medical College clinic endeavored to encourage what we call team-work. I, myself, never pass on a special infection except when it is related to something that I think I am a better judge of than the other men. For instance, Dr. Moorehead is asked to pass judgment on the mouth, so far as the jaws are concerned, and I make him responsible. The best men in their lines, men who are teachers in the college, I ask to give judgment about an infection of the sinus or tonsil. Sometimes we call surgeons in with reference to some infection in the abdomen or elsewhere that I think may add to my own knowledge of the condition before we proceed to do anything. I do not pretend to-day to carry out the technic in bacteriology. We have such men as Drs. Rosenow, D. J. Davis, H. K. Nicoll, Gaarde and other bacteriologists, working at the problems. We must all get together. The oral surgeon has no right to diagnose a systemic condition of the patient and say outright that the mouth is related to it; he should have the family physician cooperating with him before he reaches that point. Nor should the family physician nor the one having general management of the patient order teeth out without the definite advice of the oral surgeon who is capable of giving it. I believe there is much in that principle that there is a focus of infection that is the predominating factor in many systemic diseases. This is perhaps expressed more commonly in arthritis of the chronic type than in any other disease that we can mention, but it is in many. Besides arthritis, we have traced this same hematogenous infection with its embolic occlusion of the end artery as the cause of cholecystitis. Hyperplasia in the thyroid gland, which occurs commonly in rheumatism, is associated with infection of the tonsils. The hyperplasia disappears with all of the clinical phenomena with the cessation of the tonsillitis. Also in hemorrhagic nephritis, the streptococcus obtained from that producing tonsillitis, causes hemorrhagic nephritis in the animal, etc. So that the application of the principle is much wider than the average practitioner thinks.

DR. THOMAS GILMER, Chicago: To find the cause of a condition and locate its origin is all-important, but we must go further back than this. Infections in the mouth are due, in the great majority of cases, to improper hygiene. We all recognize the uncleanly condition found in nine-tenths of the mouths which come under our professional care, although the patient may be otherwise scrupulously clean. I venture to say that if we should examine the mouths of the physicians in attendance in the various sections here to-day, few would be found clean, or even approximating a hygienic condition. It

is well to cure our patients when they become diseased, but it is far better to prevent disease by teaching the people the importance of the care of their mouths, that they may not suffer from disease primarily brought about by lack of care of the teeth. Dr. Blair asked if I considered it important to curet and disinfect bone cavities after the removal of a tooth with a septic apex. As a rule I should answer in the negative. The curettement depends, of course, on the stage of the infection and the area involved. Chronic abscesses may be profitably curetted in some cases, but in the acute cases it should never be done. In acute cases I am doubtful about the use of antiseptics. I think it would be just as well to use simply a normal salt solution. Antiseptics, if strong enough to destroy bacteria, would prove detrimental to the tissues; besides we cannot penetrate the tissues with an antiseptic so far as the bacteria have gone. Is it not true that by curettement we cause a greater traumatism which renders the tissues more liable to greater infection?

SOME IMPORTANT PHASES OF RAILWAY SANITATION *

A. E. CAMPBELL, M.D.
Health Officer Illinois Central Railroad
CHICAGO

The steamship and the railway are making the world one country. Produce is now carried from Australia to England, a distance of 11,000 miles, at less cost than was required a hundred years ago to carry goods from one end of the British Isles to the other. The construction of our transcontinental railway systems soon after our Civil War, the projection of great railway systems in Russia and continental Europe in 1873, the opening of the Suez canal in 1869 and the Panama canal in 1914, made all civilized nations near neighbors.

There were carried on the Great lakes last year 7,000,000 people. The Chicago City Railway handles 3,000,000 persons each day. The suburban lines of Chicago handled 44,347,680 persons in the year 1913. The Illinois Central Railroad handles on an average 40,757 persons on her suburban lines each day, or 14,876,300 persons each year. This requires a vast amount of care and responsibility. The railroads leaving Chicago each employ from 45,000 to 74,000 people and the care and working conditions of this army of men should be supervised by an intelligent man. He should have supervision over the ventilation of trains, the condition of the diners, the cleanliness of the depots and toilets, as well as the ventilation of waiting-rooms, the condition of all eating-houses along the line, the condition of shops and yard-offices, repair tracks, construction crews and a hundred other duties which are sure to come before him. I can assure all railroads that such a man will have all he can attend to and will be well worth what he costs many times over.

THE TRAIN

The ventilation of trains or at least of the day coach is not a difficult problem if one or two points are kept in mind. A train rushing against a strong wind causes the air to pass through a train horizontally—hence, if there are openings in the end of the coach the air will pass through, as I have repeatedly proved. All end doors of all coaches should therefore have adjustable sash and the sash in the rear door should always be open. Every coach should have a thermometer and the temperature should be kept at a certain figure. The steel coach is coming more and more into use on account of its safety, and in the South this coach becomes very hot. I have found that the temperature in the center of this coach is from 2 to 4 degrees higher than in the ends and as the electric fans are in the ends they are cooling the part of the coach that is cooler anyway. There should be two oscillating fans in the center of the coach, but if four fans consume too much electricity, three English paddle fans should be installed 15 feet apart. This will distribute the air more evenly.

Spitting on trains is so reprehensible that I believe a slip should be issued by all railroads and used in the state through which they run as follows: "In view of the authority vested in the State Board of Health you are liable to a fine of $25 for spitting, sneezing or coughing on trains without taking the precautions mentioned on this slip." On the back of the slip instructions should be given where to spit and how to cough and sneeze with the handkerchief before the face. Railroads do not like to displease their patrons and state boards should assist and issue these in the name and by the authority of the state board and thus help to stop this disgusting practice on trains.

All coaches should have separate apartments for water and ice. I see ice handled so carelessly—slid along a platform over tobacco spit and other unmentionable filth, laborers taking up the ice with their bare hands and dumping it into the drinking-water—that I have very firm convictions on this point. I do not believe it is wise to have ice in the water in our dining service, mainly because of the methods of handling the ice. Then, again, this ice is handled by a cheap class of laborers who are not overly clean and tidy and I hope all railroads will abandon the placing of ice in the drinking water on trains or on diners.

There should be a folding washbowl near the pantry in all diners, but I strongly object to a toilet in a diner, as no person would care to have odor from a toilet come to his nostrils while eating. All waiters should be instructed to wash their hands before serving food and this would be a good rule to follow in all railroad lunch rooms. It is not very appetizing to see a waitress fix her hair and pick her nose and then without washing her hands hand a piece of pie or come with her finger in the glass of milk. It is because these very matters have come under my observation that I speak of them.

The carriage of tuberculous people on trains has caused much comment and in some states attempts at legislation. We cannot deny that there is a degree of danger, but no more than from many other diseases. There is no denying the fact that diseases are transmitted from person to person and usually can be traced to excretions thrown off from the infected mouth and nose. Indeed we are all more or less exposed to this wide-spread infection at some time or other in our lives. From the best authority we can find we fail to gather information that a person traveling on a train or steamboat reasonably well ventilated would contract consumption, even though there is consumption among his fellow passengers. There is absolutely no evidence proving such incidence of infection. Yet there may be individual cases which may point to such a possibility; but they do not prove

* Read before the Section on Preventive Medicine and Public Health at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

it. Other evidence, however, leads us to suspect that the journey on the passenger coach has little or nothing to do with it. The chief physician of a great sanitarium for tuberculosis told me that it would be impossible for the common carrier to segregate those cases, as there were thousands seemingly well or healthy individuals who excrete tubercle bacilli in abundance. Indeed, I believe it would be well for common carriers to have literature on tuberculosis, or it might be well for state boards to have literature telling how the tuberculous patient should behave to protect himself and the public. For instance, the following rules might be circulated.

INSTRUCTIONS TO TUBERCULOUS PATIENTS

The tuberculous patient must consider his own welfare as well as the welfare of those about him.

1. He should be in the fresh air as much as possible night and day.
2. He should be cheerful, look on the bright side of life.
3. He should eat only nourishing food—meat, vegetables, bread, buttermilk, cream, eggs.
4. He should avoid style, dress to suit the changes in the weather, always carry an overcoat and two or three handkerchiefs.
5. He should keep his nose, mouth and hands clean.
6. He should take at least nine hours of sleep at night, and if possible a nap in the afternoon.

SOME THINGS THE TUBERCULOUS PATIENT SHOULD NOT DO

1. He should not mingle in large crowds of people or be where there is dust or smoke.
2. He should not take tobacco or alcohol in any form.
3. He should not cough needlessly, but only when he feels he must expectorate.
4. He should not work when feeling ill.
5. He should never swallow his sputum, as it may cause tuberculosis of the bowels.

SOME THINGS THE TUBERCULOUS PATIENT SHOULD NOT DO, FOR THE WELFARE OF OTHERS

1. He should not spit anywhere except in vessels for that purpose or in paper napkins, which should always be burned.
2. He should not cough or sneeze without covering mouth and nose with handkerchief.
3. He should not kiss any person.
4. He should not eat or drink from dishes that may be used by others.
5. He should not sleep in the same bed with another person.
6. If riding on a train he should always take a state room or a berth in the rear end of the car and have cuspidors and paper near him and expectorate only in them.

I believe something like this should be carried by all common carriers and I feel confident state boards could aid common carriers very materially by having something like this in such public places as the waiting-rooms of depots, etc. It would be well for state boards to distribute some literature to this class so that if they travel they can be informed of the precautions they are expected to take.

Tipping on trains and on Pullman sleepers has gone so far that it has become a menace to the traveling public. There are many hotels and many more restaurants which forbid tipping. One of the leading hotels in St. Louis prohibits tipping. The McKinley electric lines through Illinois prohibit tipping on all their trains and it is time for all railroads and the Pullman people to get away from it. It is undignified and un-American and the quicker we stamp it out of this country the more we will dignify ourselves in the eyes of foreign nations.

I quote from the Washington *Post* to the effect that a young man paid three thousand dollars a year to his employer and hired several clerks and became rich in a short time. This shows how insidious a vice this is becoming. Not a man who is a member of any organization but condemns this vicious practice in the strongest terms, and railroads and the Pullman companies as well as all other corporations should bid adieu to this undignified practice.

The "butcher" or fruit vender on trains, with dirty hands and dirty linen, is a nuisance to many passengers and I believe often disseminates disease. One of our surgeons told me of a fruit vender he was treating for a specific disease, who came from the toilet room without washing his hands, handled and sold fruit to a woman with a young child. In the course of a few days the child was brought to the surgeon with a very sore eye which proved to be a gonorrheal ophthalmia. Not only should fruit venders be urged to wash their hands and keep clean but they should be examined regularly as well as all dining-car employees.

THE TRACK

There is much agitation over track pollution by interstate carriers and although I have watched for the number using the toilet I was unable to determine how much fecal matter was discharged. I therefore selected the part of our road having the heaviest travel through the central part of Illinois. Starting at Centralia at 9 a. m., with buckets under all hoppers and traveling 275 miles with 564 passengers there were three bowel movements and much urine. Returning at 10:30 a. m., the same distance, with 645 passengers there were but two bowel movements and much urine. Next, the train from Chicago to St. Louis was taken. This train leaving at 10:05 a. m. with 193 passengers, arrived at St. Louis at 6:45 p. m. There were no bowel movements but much urine. Returning, a distance of 300 miles with 394 passengers, arriving in Chicago in eight hours, there were no bowel movements and very little urine. There is no doubt but there is much urine thrown off, but the constant jarring of the coaches inhibits the peristaltic action of the bowels in the vast majority of traveling people. The secretary of one of the boards of the Northwest told me that he has traveled from Winnipeg to New York and return without a bowel movement. Urine as it leaves the body is said to be aseptic and providing typhoid germs are thus thrown off, sand or gravel is not the soil in which they can long survive, and there must be a relation between the seed and the soil. It is not wholly the one or the other with which we have to deal as practical men. It is the combination and the interaction between the two. I have also made a careful inspection of our main track over which our through trains pass between the hours of 9 and 12—the hours when bowel movements are most likely to occur. In company sometimes with state or city health officers and railway officials we failed to find any evidence of human excrement and the railroad official explained that the constant fanning of the long freight and passenger trains dried out all human excrement. We did see an unusual amount of cattle manure, however, and as it is said that cow manure contains the colon bacilli, this matter should be seriously considered, for cattle are just as likely to drop their excrement directly into the water. It is no more dangerous for cattle to drop this on the track than

beyond the fence by the right of way, but from an esthetic point of view it would be well for railroads to prevent as far as possible the dropping of this occasional movement on the sidewalks of cities and villages and I believe a false trap could be attached to the bottom of all hoppers or there could be a lock put on the flush bar or handle so that this could be flushed at points where there was no danger of sidewalk pollution. I am very sure this can be done. At some points where our sleepers stand over night there should be a bucket under all hoppers and the toilets left unlocked for the convenience of the passengers. Cattle pens along the line should be kept clean and whitewashed.

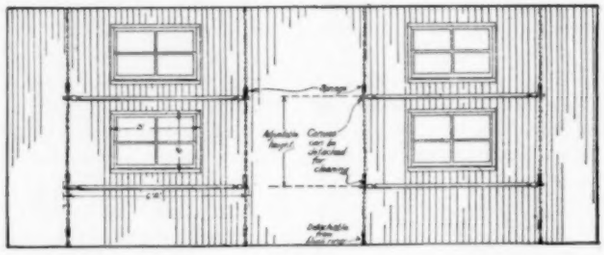

Fig. 1.—Elevation of interior side of box car showing arrangement of sanitary canvas beds.

CONSTRUCTION AND SURVEYING CREWS

I have on two former occasions called attention to this class of work and it seems that very few railroads and scarcely any state boards in this country have taken cognizance of this important part of sanitary work. When I called attention to this phase of the work—three hundred men throwing their excretions everywhere along the track while at work—I was curtly asked if three hundred was any worse than sixty passengers dropping their excretions on the right of way, when in reality not four persons drop their excretions in a journey of 300 miles. I have seen so much of this that I again call attention to it and have laid down some rules that should be followed. I have also designated the equipment that all camp cars should carry, as I often find them with no lime, no kerosene, nothing to destroy bedbugs or body-lice. Often small-pox breaks out among this class of laborers. Often gonorrhea is prevalent and it is important that separate towels should be provided for the men. I strongly recommend that these instructions be given to those in charge of camp cars:

Fig. 2.—Sanitary canvas beds. Our company installed a large number of these beds in all our camp cars. They can be taken down and sunned and aired; combine simplicity with cleanliness; the canvas can be easily removed and washed.

INSTRUCTIONS TO BE GIVEN TO THOSE IN CHARGE OF CAMP CARS

1. See that all cars are properly screened and ventilated.

2. See that all cars have the following equipment: a portable toilet; a barrel of lime; one-half barrel of powdered sabadilla; 5 gallons of kerosene; one covered garbage can; 50 pounds of sal soda; one 14-inch rattan scrub broom; soft soap; wash pans; towels and a fly-swatter for each car, and 1,000 3-grain quinin capsules. Vaccinate all men.

3. Assign a man three hours each day to scrub kitchen and dining-room, and all sleeping-rooms every other day, to air all bedding, to ventilate all sleeping-rooms, scrub and lime all closets, and to see that fresh water is provided for all the workingmen. If in a low marshy region 3 grains of quinin should be given twice daily.

4. See that but eight men are assigned to a car and that all cars have sanitary beds.

5. See that all garbage is destroyed or gotten rid of each day.

6. When building a privy dig a vault 5 feet deep and 2 feet wide and as long as needed, then put 6 inches of unslacked lime in the bottom and cover deposits daily with lime.

The privy vault at small railway stations is a necessity and if it has fallen into disrepute it is because of neglect. I am confident that it is far superior to Stiles' bucket as it is much easier to cover the excretions in a vault already made than to make a vault and then cover it afer carrying this offensive mass for some distance. Dr. Smith in his *Air and Rain,* says:

> If soil affects the atmosphere how does it happen that it is such an excellent disinfectant? Substances are purified in the air to the same extent, and in the same time as in the soil. The great amount of surface presented by the porous soil is mainly the cause of the rapid reaction, but the acid humates and probably other substances act chemically. There are modes of oxidizing in the air beyond the power of ordinary oxygen; one of these is by means of nitrogen oxids and another by ozone. But even these require great time and space. If we throw sulphureted hydrogen water or its compound with ammonia on a few inches of soil it passes through, oxidized in a few minutes. We can obtain such action in the air only in great volume although in the end the work done may be better for its purpose. It is, however, possible to overload even the porous soils which oxidize the most rapidly; that is, it is possible in a given case to have more organic matter than admits of oxidation in a certain time and putrefaction is the first result.

Now if soil is used freely, say three times as much soil as excreta, this putrefaction will soon disappear and, indeed, may be prevented as I have repeatedly demonstrated. The plan we have adopted and which I can recommend is to dig a vault 5 feet deep, then put 6 inches of pure unslacked chlorid of lime in the bottom. Save all the earth removed from the vault and add this each day or twice a week, and when the vault is full use this as a fertilizer. There will not be a particle of odor and except a few streaks through the soil one could not tell it from the ordinary soil. I have had section men dig down over a privy vault three months or more after it was abandoned and we could not tell it from ordinary soil. This, however, was exposed to heavy rains. If this soil is used as fertilizer it should not be used in gardens for one year at least.

The care of the excreta of fifty men at our shops and small terminals where there is no sewerage is

another matter, however, and I am using an incinerator, and in some places where there is a pump engine boiler the excreta can easily be burnt in this. If not, then a castaway engine grate can be used by having it raised 12 inches from the ground, building a hot fire under it, throwing kindling wet with kerosene on this grate and adding the excreta and some tar to keep down odor. It is surprising how effectually tar will keep down odor. I have also used creosoted pile heads, which keep down odor very well. This is a method which all railroads can easily use and should use as a safe measure. There are always a lot of odds and ends to be burned at all shops and these could be used at this time.

We have a great amount of trouble at our stations by having our toilets abused by people who are not patrons of the railroad. If state boards and the public health service could insist that all municipalities have public toilets as they should, railroads would not have so much trouble with theirs. We often get notice from a health officer that we must install a privy at a certain place when it is used almost exclusively by citizens of the town who never patronize the road. Why should not these public officials get after municipalities which have such an army of worthless people to provide toilets for them? Other countries have them and state boards should insist that all large municipalities have public toilets.

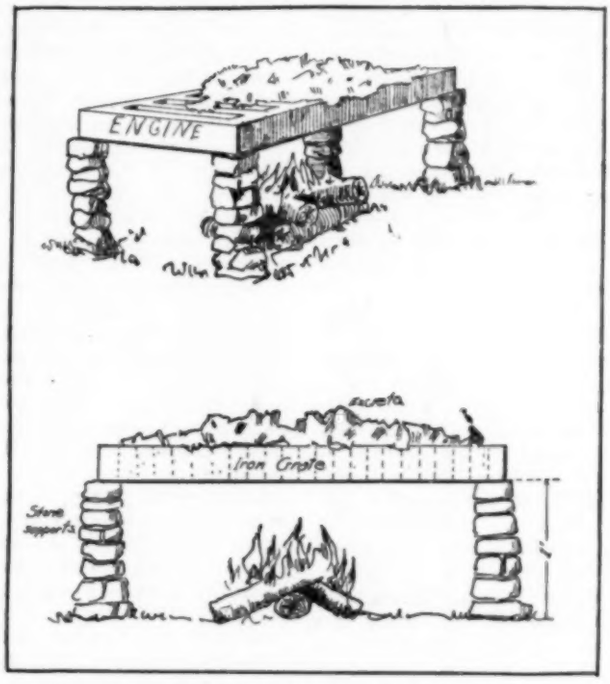

Fig. 3.—A method of disposing of excreta by incineration.

THE SHOPS

When the railroad shops are built in a swamp, as they usually are, proper drainage should be provided and drinking-water looked for at once. This drinking-water should not be taken from the tank, as I have frequently found, until the source of such water is ascertained. There should be ventilators over the forges in the blacksmith shop and the master mechanic's office should be so located that smoke and gas from the engines would not come near it. Indeed, all general offices should be so located that gas and smoke would not be offensive. I have firm convictions on this point. It would seem more accurate and perhaps wiser to deal with the human being as if he were a machine, with his efficiency as measured by his output, and endeavor to find what the conditions are which lower his efficiency. Sir Thomas Oliver in his masterly address on "Dust and Fumes, Foes of Industrial Life," pointed out the human and economic aspect of the work in which we are engaged. Indeed, it is estimated that nearly 70,000 wage-earners perish every year from industrial tuberculosis and that by factory inspection and effective methods for the prevention and removal of dust and gas fully one-half of these lives could be saved. This is not speculative, and abundant evidence can be produced that gas and smoke and fumes of gas are detrimental to the public health as well as lowering to the efficiency—either impairing it temporarily or tending to impair it permanently. I can also testify to the fact that this gas from engines prevents the proper ventilation of offices, and since such statements are true I urge all railroads to have their offices in the country. Our company has 50 acres 15 miles from Central Station and why would it not be wise to build offices at this place with outside porches, swimming pool, abundant shower-baths and a large park for general games at the noon hour? Not a man reading these lines but will say that such a step would increase the efficiency of the working force and be a credit to the management.

Noise would also be avoided; indeed, the blowing of whistles and constant ringing of bells when the train is standing still is a nuisance and is prohibited by many municipalities. M. Emile Gautier declares Paris is becomming uninhabitable because of noise. Every pulsation and noise, he explains, causes nervous shock, comparable to a blow with a hammer, and is felt throughout the entire cerebral mass. These shocks are liable to cause or to create serious trouble. Experts who have studied the noises of Paris and their effects on the nerves and brain matter are convinced that the modern malady of neurasthenia is directly attributable to the riot of sounds by which we are daily assailed. No other explanation is needed for the growing number of nervous disorders. The pledge given Mrs. Rice by a little child in her campaign against unnecessary noise is wise and should be practiced by all trainmen—"I promise not to play near or around a hospital, when I do pass I will keep my mouth shut tight, because there are many invalids there, nor will I make myself a perfect nuisance."

ABSTRACT OF DISCUSSION

DR. A. M. HARVEY, Chicago: Certain corporations have had medical health departments for over a quarter of a century, and the appointment of such an officer is becoming quite universal among the large corporations. About a month ago in an investigation among the larger industries of the United States, I received something like thirty replies to my inquiry which covered several questions: "Do you maintain a health department?" "Do you examine men physically?" "If you do maintain a health department, is it in control of a physician, and what voice does he have in the management?" Of the replies received from corporations that were fairly representative of the industries in our country, and probably employed several hundreds of thousands of men, about 70 per cent. of the answers showed that they examined, physically, all applicants for work before

employing them. That simply indicates the interest that corporations as employers of labor are taking in the health problem. The importance of medical supervision of health in industry is also emphasized by recent legislation in several states whereby it is made mandatory in certain trades and occupations, and by sanitary regulations imposed on employers in general. Among the advantages claimed for corporate or private medical health departments are: 1. Safeguarding the health of employees from the dangers of those seeking employment who may be afflicted with dangerous or infectious diseases. 2. The assurance of a fairly good working force from the beginning, by the physical examination of applicants. 3. Affording employees opportunity for early consultation, before an ailment has become established, thereby giving them the best chance for a cure. Employees are prohibited from returning to work before convalescence is well advanced, thus insuring a permanent cure. Employees in hazardous positions by reason of physical infirmities are placed in positions of security. Loss of time on account of sickness is lessened. Sanitary conditions of shops and offices, and favorable working conditions and environments are insured by personal inspection by sanitary experts. Prevention of disease, like the prevention of accidents, insures a more efficient working force. The health department in a corporation increases the efficiency and earning power of the men. Judged by the great amount of money that has been expended in this direction by several large corporations, notably the Crane Company, the International Harvester, and the United States Steel and their subsidiary corporations, the health department pays; and the housing and living conditions have also been improved. A wonderful change can be brought about by a health officer who has the confidence of the corporations; but much yet must be done. The great work at present is to improve the living and housing conditions of the employees.

Dr. J. W. Kerr, Washington, D. C.: Dr. Campbell mentions a number of problems that are of interest to the traveling public. The term "car sanitation" is somewhat indefinite. It must, of necessity, include more than the sanitation of the cars, just as industrial hygiene must include more than sanitation of shops; for instance, the economic and sanitary conditions in the homes of laborers. It is important for us to approach these problems without prejudice. From the point of view of comfort and convenience, generally, the railroads of our country are in advance of the people who travel on them. I had occasion, recently, to compare the sanitation of our cars with those of foreign countries. A standing order in the Treasury Department requires any medical officer of the Public Health Service who travels under official orders, as soon as he returns to his station, to submit a report on the sanitary condition of the trains occupied. This report is immediately forwarded to the Secretary of the Treasury, and is then returned to the Bureau, and any criticism contained in the report is brought to the attention of the railroad company, if it is severe enough to warrant such action. Under this order I made an inspection of a train on the Baltimore and Ohio Railroad, running from Washington to New York. Like inspections were made in Europe of trains operated over state and privately owned railroads. On the American train there were no common towels, and liquid soap was furnished in every car. The toilets were clean, and locked up while crossing waterways. In other respects this train was in good sanitary condition, and the railroad stations at both terminals were also in good condition. Many of the trains occupied on the continent, on the other hand, with the exception of the train from Cherbourg to Paris, were abominable; and some of them were state-owned, state-operated roads. This experience is cited as evidence that the railroad companies of America are trying to meet reasonable requests of the traveling public, and they are approaching these problems from a practical point of view. I think they want to improve conditions. One of the subjects needing careful study is the influence on health of gases in tunnels. Within the year a number of samples of gases have been collected by the Public Health Service from tunnels used by coal-burning engines and electrically operated engines, respectively. The results of the analyses have been tabulated and are now in press. Studies are also being continued, of the extent of the migration of tuberculous persons in interstate traffic. There are about five or six areas to which tuberculous persons from all sections of the country travel for changes of climate. We know nothing, however, of the volume of this travel; and we know very little of its effect on the public health. The regulation of it is difficult; and for that reason probably has not been as fully studied as it ought to be.

Dr. John W. S. McCullough, Toronto, Ont.: Railway sanitation is a serious problem in our country because railway construction is active there. Dr. Campbell referred, however, to other carriers; and that allows me to speak of the pollution of the waters of the Great Lakes separating Canada from the United States. Last year, at the instance of the international joint commission, our board of health, in conjunction with the United States Public Health Service and some state boards of health bordering on these waters, made an extensive examination of the waters of the Great Lakes and connecting rivers. This investigation, which lasted from April to November and is perhaps the largest undertaking of a similar character ever completed by any of the countries of the world, demonstrated that while the lakes themselves are practically pure, the connecting rivers and portions of these lakes are dangerous to those who travel on them. When the enormous commercial and passenger traffic on the Great Lakes is recollected and also that the incidence of typhoid fever in the towns on the Great Lakes is the largest found in any part of these countries the dangers to the traveling public on these lakes is of deep concern. It was demonstrated that St. Mary's River, St. Clair, Detroit, Niagara and St. Lawrence rivers were badly polluted; in fact, there are portions of the Detroit River which are so polluted as to be unfit for use after the most careful purification. None of the water of the St. Clair, St. Mary's, Niagara or Detroit rivers is fit for use without purification. From the mouth of the Niagara River the pollution is carried out into Lake Ontario for a distance of from 10 to 16 miles. Lake Ontario, in the line of boat traffic from Niagara to Toronto, is only 30 miles wide, hence this pollution travels across the international boundary; and in the line of this large traffic it is impossible to secure a pure supply of water for these boats without taking it from some source other than from the lake itself. I hope all will study this report and the significance of this boat pollution of the international waters on our traveling public. We have required a great many Canadian steamboats to take their water-supply from the middle of the lake in large tanks, and also to treat it by means of calcium hypochlorite.

Dr. G. H. Sumner, Des Moines, Iowa: Dr. Campbell has given us some excellent plans for the railroads to follow; but, on the other hand, it seems to me that state boards can give the public some instruction relative to the way that they should travel. Education is nothing more nor less than a bundle of habits; and Dr. Hurty has well said that you cannot hope to redeem the adult, but you may train the child. Therefore, it seems to me, that we should issue short tracts of instruction to the public relative to their habits in travel. I rode on a Chicago Great Western train not long ago. The car was filled with people and the ventilation was poor. In one portion of the car was a woman and several children. I won't attempt to describe the condition of those children, but the odors in that car were extremely unbearable. Two train officials, complained to concerning the bad air conditions, failed to perceive any need for increased ventilation. When I reached Des Moines I reported the occurrence to the railroad commissioners and received a courteous letter from them. I believe, with Dr. Hurty, we had better begin again to teach the younger generation how to keep clean, and then to help the railroad companies in their efforts to better the conditions of travel.

Dr. W. H. Sanders, Montgomery, Ala.: Dr. Campbell is undoubtedly doing a great work in his field; and I am glad to say that the corporations very generally are upholding work of this kind. One of the largest corporations in the

country, with its headquarters in my state (Alabama), has within the last two years organized quite as systematic a medical force for the purpose of looking after the health conditions prevailing among their employees as may be found in any of our states; and from visits to the grounds occupied by this corporation I see very great improvement. This work will spread among the corporations all over the country. Dr. Campbell's paper should be sent to all of the large corporations in the country. I want to emphasize that the people need educating on sanitary lines as much as the managers of corporations. In formulating rules applying to railroad sanitation in my state I have made them applicable to the traveling public quite as much as to the employees. If people traveling on trains are ignorant of what is reasonably decent and clean, they ought to be required to learn.

DR. CHARLES C. BROWNING, Los Angeles, Cal.: Some work has just been completed by Surgeon Carrington of the U. S. Public Health Service in California south of San Francisco and in Arizona, concerning the influence of the movement of tuberculous patients on themselves and the traveling public. A great deal said with regard to the danger from the tuberculous patient doubtless is true; much is founded on sentiment and not on scientific data. Surgeon Carrington has spent several years in the Southwest and has been doing very thorough work in our particular section. I presume that the report will be available through the Department of Public Health.

DR. W. C. RUCKER, Washington, D. C.: The question of railway sanitation is a question of sanitation. When you have said that, you have said all. The sanitation of a vehicle is not different from the sanitation of a house. It is merely that of a house on wheels. The attempt to surround railway sanitation with something mysterious, something which stands off by itself, is wrong. The attempt to make the railroad companies and the other transportation interests of this country the goat whenever it comes to anything sanitary is equally wrong. In enforcing the interstate quarantine regulations I have dealt with a large number of railroads; and there has never been an order, a suggestion or a comment made to those common carriers by the U. S. Public Health Service which has not been acted on favorably and immediately. The railway companies, as has been said, in their sanitary methods are in advance of the people living along the right of way. Furthermore, when they are asked to furnish an example to people living along the right of way, they are invariably willing so to do. I do not believe that much education is necessary with regard to the railway interests of this country. I do agree that we should educate the general public how to travel on railroad trains; and, in order to do that, we must educate them how to live in houses. Not until people realize that cleanliness is our great bulwark against disease, whether it be in the home, the train or the ship, will they keep their environment clean. A speaker at the surgeon-general's conference the other day put the thing very aptly. He said that regulations had been made excluding from trains the common towel, that the common drinking-cup had been abolished, and that it would not be very long until the common brush and comb were taken from the train. He said, after that the next thing will be to abolish from trains the common hog.

DR. CHARLES J. HASTINGS, Toronto, Ont.: I would emphasize the importance of better safeguarding in transportation by water. Dr. McCullough has already drawn attention to this in his reference to the work being done by the international joint commission. We have had an excellent demonstration in Toronto of the necessity for prompt action along these lines. In 1911 we found that a large percentage of our cases of typhoid in the summer months was traceable to the boats that cross our international waters. On investigation we found that the water used was all more or less contaminated with sewage. When the order was first issued to the company to abate this nuisance forthwith, they treated it with a certain amount of indifference, I then wrote them that their boats would be tied up at the docks on their return if they did not give ample evidence that their crew and passengers were to be properly and efficiently safeguarded; this resulted in prompt action on their part. They are only permitted to take water from the center of the lake; they have installed tanks of sufficient capacity to meet their requirements for the balance of their trips. Most of these boats have been so equipped as to meet these requirements and, consequently, this source of danger has been practically eliminated. Hundreds of thousands travel annually over the international waters extending from Duluth to the mouth of the St. Lawrence, into which, by our primitive methods, we are pouring millions of tons of sewage every day.

DR. M. P. RAVENEL, Columbia, Mo.: A very excellent paper by Dr. J. O. Cobb of the Public Health Service appeared in THE JOURNAL of the American Medical Association several years ago calling attention to the fact that whether or not steamships on the Great Lakes took their water from the center of the lake, they got a certain amount of sewage into their water tanks, because the pipe through which the water is drawn opens out through the bottom of the ship, and when standing in port this pipe is filled with sewage. When the pumps are started to fill the tanks with water this sewage is first sucked up.

DR. N. F. CAMPBELL, Chicago: One word about education. The railroad I am connected with issues a magazine—fifteen or twenty thousand copies a month—and we have an article on sanitation in that magazine. I don't believe that water-coolers can be kept clean by cleaning them out every two weeks. They ought to be cleaned out at the end of every run. You will always find them dirty then. I have had a good deal of trouble with dumps. Railroads have a lot of waste material, and they throw it all into one place as filling material. This causes all kinds of trouble, and I have concluded that they should not do that without taking extra care about it.

LOCAL ANESTHESIA IN THE PREVENTION OF AFTER-PAIN AND SHOCK

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Immediately after a major operation under local anesthesia one is impressed by the well-being of the patient and by the diminished after-pain as compared with similar operations under narcosis. The inference that we have here the solution of the problems of after-pain and shock is easily made; but unfortunately most surgeons come to realize that these problems are not simple ones, and that local anesthesia is not alone adequate to solve them.

I. AFTER-PAIN

After operations patients begin to feel pain at various periods, depending on the anesthetic used and on such other considerations as normal differences in the regions operated on, the state of tissue at the site, and the attitude of the individual toward discomfort and pain. The duration of anesthesia by an agent used locally can be determined approximately by experiment, but in an operation such data cannot be entirely trusted because of the variable factors mentioned above.

Generally speaking, we may consider that anesthetics interrupt the propagation or perception of painful impressions, and that the amount of painful impressions originated does not vary no matter what agent is used. If local anesthesia lasts an hour or two, the total after-pain is reduced by that much. In the case of ether anesthesia, the time between the infliction of the first wound and the return of consciousness deducts from the total after-pain. In many of the published observations on after-pain, a fallacy

to the discredit of ether anesthesia has been introduced from the fact that most operators use a preliminary dose of morphin with local anesthesia, but not with general. The effect of this narcotic may last after local anesthesia has worn off, but does not interfere with the clear consciousness of the patient that he has withstood the operation. For this comfortable state of mind, the local anesthesia is likely to get the credit. On the other hand, when the ether patient who has had no morphin awakens, his befuddled brain is impressed with pain impressions from the operated region. His sensitiveness is heightened, his orientation confused, and his vocabulary loosened.

If one compares a long series of patients who have been operated on for the same malady, some with local, some with general anesthesia and all with a preliminary injection of morphin, with a like series in which morphin has not been used, one finds that the difference between local and general anesthesia as to the amount of after-pain is not very great. If, now, a similar series of comparisons be made with novocain and gas, with and without morphin, one has a fair basis for comparing the different methods. Ether patients complain the most, but between gas and novocain patients there is not much difference when the duration of the novocain anesthesia is considered.

Patients who have been operated on at one time under ether anesthesia and subsequently for a similar operation under local anesthesia—as, for instance, when operated first on one side and then on the other for hernia, or for block dissections of the neck — when asked to compare the methods, declare invariably in favor of local anesthesia because they escape the ether. The difference in after-pain is seldom mentioned. In a few cases only, such as about the anus, and in the fingers and toes, is after-pain a prominent feature. If one places the two methods in this way approximately on equal grounds, one loses much of his enthusiasm for local anesthesia as a preventive of after-pain.

In considering after-pain with local anesthesia, one must consider the hyperesthesia which often occurs about the insensitive region. As I have previously pointed out elsewhere, this is an extreme hyperesthesia to touch which often lasts for days and is difficult to estimate or to control. Irritation by the end of a suture or from the sliding of a dressing may cause acute pain. Such pains are usually disregarded by the operator because he fails to comprehend them or to measure their importance. After experiments on myself I have more than once, when the bedclothes gently stroked an hyperesthetic area, sat up in bed and delivered eloquent remarks on the folly of self-experimentations. These things have received scant recognition in the literature, but they sometimes play an important part in the discomfort of the patient and must be added to the sum total of after-pain in operations under local anesthesia.

These remarks apply especially when novocain in combination with epinephrin is the local anesthetic used, because of its evanescence. There are some cases in which local anesthesia may be used with confidence to prevent after-pain. Quinin, when properly used with full consideration for the possible hyperesthetic zones, is of great value on account of the duration of its effect. In major amputations, infiltration of the exposed nerves with quinin and urea hydrochlorid relieves after-pain and its consequences with certainty. In the incision of inflamed areas on the extremities, such as felons, blocking with quinin will control the after-pain for a long time. In general it may be stated that, when all nerves leading to a part can be infiltrated with a lasting anesthetic, pain may be controlled. In regions in which nerve anastomosis is free, as about the anus, the pain is as likely to be increased as decreased by the anesthetic unless definite rules are observed. In operations for hemorrhoids, for instance, infiltration of a ring about the individual pile may be followed by exquisite pain, while infiltration directly into the pile itself will be usually followed by prolonged anesthesia. The reason for this is plain. The prolonged effect of quinin is due to the granular fibrin deposited about the nerve-endings and fibrils. Therefore, when a ring is injected about a pile, the skin is anesthetized for a long period only where there is a deposition of fibrin. The area within is anesthetized for a brief period only and when this brief period is ended hyperesthesia replaces the anesthesia, and if a ligature or suture has been placed in such an area, exquisite after-pain is the result. Sacral blocking with quinin in operations on the anoperineal region serves in most instances as an effective means of controlling postoperative pain for a long period. It is possible that such prolonged blocking of the nerves may affect the healing of the tissues.

Ford Rogers first used quinin and urea hydrochlorid purely for the control of after-pain, by injecting very painful areas during major operations under ether. For instance, if hemorrhoids are operated on at the end of an operation for other disorders, the pile is directly injected with quinin. In this way the prolonged after-pain is controlled. In major operations, generally, the nerves can be injected before they are severed. In order that such injections shall relieve the after-pain, however, they must be done with the same care and in the same manner as though the operation were being done under local anesthesia.

The greatest service of local anesthesia in the prevention of after-pain has been in teaching the operator which tissues are painful. After-pain usually results from the incision in the skin, which produces a burning or stinging sensation lasting some hours, and from the ligation of sensitive parts, which produces an intense burning or throbbing pain lasting from twenty-four to seventy-two hours. If, therefore, one avoids placing constrictions about painful tissues, there will be relatively little pain. This applies to stitching of such viscera as the gall-bladder, folding of round ligaments, ligation of nerves and particularly tight suturing of skin.

Fortunately, tissues that require firm suturing are insensitive and sensitive tissues do not require firm suturing. Fascia has no nerves, and if in the course of an operation requiring the opening of the abdomen the prefascial fatty tissue is elevated, the fascia proper is without pain. The parietal peritoneum must be coapted with the greatest gentleness, with fine sutures, using just sufficient force to bring it into contact. The fascia, when freed from the nerve-bearing fatty layer, may be sutured together firmly and under such tension as will relieve the strain on the peritoneal sutures. This line of sutures is the only one of consequence in securing firm union, a fact abundantly attested to in the various operations for hernia. If vessels requiring ligation have been severed the accompanying nerves must not be included in the

ligature. The importance of this can be best studied in ligating the superficial branches of the deep epigastric vessels in operations for hernia. If the vessels are picked up before they are cut they may be ligated without pain. This cannot be done with a heavy forceps, but with delicate instruments small vessels may be readily picked up without any surrounding nerve-containing tissue. Even slight constriction of nerves becomes painful when the effect of the anesthetic passes off.

From the foregoing it would seem that by the use of quinin and urea hydrochlorid, after-pain could be controlled with certainty. Unfortunately, this drug by its mode of action brings with it its own limitations. The prolonged anesthesia is due to the deposition of granular fibrin (often erroneously referred to as edema). Anesthesia lasts until this fibrin is absorbed. The amount of fibrin formed depends on the strength of the solution, the length of time it acts, and the character of the tissues injected. Moderate injection of the skin produces a prolonged certain anesthesia. An excess produces a retardation of the healing of the wound. In loose tissue, as of the neck and preperitoneum and in muscle, exudate is excessive, and an indurated mass results which may disturb the line of suture. In the peritoneum and in the neck the thickened masses may cause the patient some apprehension, and about the anus they give an uncomfortable feeling of fulness. It is only in conditions in which prompt healing is not imperative that quinin can be used to secure its fullest effect as an agent to control after-pain. These conditions are found in anal operations and in the opening of abscesses, particularly appendiceal, pleural and pulmonary. The control of pain is perfect in nerves exposed during the course of operations. Experience alone enables the operator to approximate the effect he desires to produce. Imperfect as it is, however, quinin alone at the present time offers any hope for the control of after-pain.

With this, I believe, rests the problem of after-pain. Local anesthesia may teach us to perfect our technic so that after-pain is reduced to a minimum, but it cannot prevent it. The cheerful squirting of a few syringefuls of local anesthetic solution in the neighborhood of a carelessly handled wound is entirely futile. The skilled operator who by study or intuition has learned delicacy of manipulation is able to decrease greatly the after-discomfort incident to the operation. Local anesthesia contributes to well-being after operation, not chiefly by preventing after-pain at the seat of operation, but by eliminating the effects of ether. Schlesinger is no doubt speaking from experience when he expresses the opinion that we are just beginning our studies of the use of local anesthesia in the amelioration of after-pain.

II. SHOCK

The use of local anesthetics prevents the transmission of impulses to the brain during the time of operation and for a variable period afterward. What effect the transmission of the pain during the operation may have on the subsequent well-being of the patient is not easy to estimate. Intense after-pain, as after unskilful ligation of hemorrhoids, or tight sutures in other sensitive tissues, may produce intense pain for prolonged periods, but shock does not follow. On the other hand, shock may follow operations on regions not particularly sensitive.

The kind and source of the pain must, therefore, be a factor in the production of shock; but because of the close association of the various types of nerves the importance of painful impulses in the production of shock is not definitely known. We do not know what shock is; we know only something of the conditions under which it occurs. It is difficult, therefore, to estimate the value of local anesthesia in the prevention of shock. Besides inhibiting pain the anesthetic may inhibit afferent impulses which are not perceived as pain, but which produce the state we call shock. If this be true local anesthesia might be a factor in the prevention of shock or might even prevent it entirely.

Enthusiasts have, in fact, stated that with local anesthesia there is no shock. This is not true, and as the experience of the enthusiastic advocate of local anesthesia increases, his statements become more conservative. There can be no doubt that shock is diminished, but whether this is due to the merits of local anesthesia or to relief from the ill effect of general anesthesia is still a question. If big operations are done under local anesthesia, even when there is no pain, one can now and then feel his patient wilt under him. This may occur without the patient suffering pain or mental agitation or loss of blood, and when intoxication from the anesthetic used is not likely.

This may be best observed in block dissections of the neck for carcinoma of the lip and tongue. A case in point may be cited. The patient (man aged 56) came to the table perfectly calm. The operation proceeded without pain. Everything was being removed but the common and internal carotid, the sympathetic and vagus. As efforts were being made to get a ligature on the jugular high up, the patient began to lie flatter on the table. When asked if he was feeling it, he replied, "No, not a bit," but came back with the question, "Are you about through?" Is he receiving impulses from the field of operation not interpreted in terms of pain? Is it a feeling of anxious apprehension and if so would gas at this point save him? Anticipation of this state by the use of gas in the latter stages of the operation does not prevent the collapse. I believe his apprehension is due to impulses he got which were not fully blocked off—perhaps a tugging on the jugular within the skull. At least it occurs in individuals who deny that they experienced either pain or fear.

The occurrence of shock is a rare thing outside of traumatic accidents (whether or not produced by surgeons). When shock does occur in the hands of a competent operator it affects patients suffering from metabolic disturbances or from lesions which make extensive traumatism necessary, such as deeply seated adherent tumors, the removal of which is attended by injury to sensitive tissue. Of course it is difficult to estimate accurately the mental state of the patient. We can only judge by what he tells us and by what we can see. Patients who do not admit pain and seem to suffer no mental agitation sometimes return to bed weary and in perspiration. It has always seemed to me that the removal of tissues abundantly supplied by sympathetic nerves is more apt to be followed by this condition which we may call mild shock. In laparotomies under local anesthesia, explorations about the duodenum and gall-bladder or pressure on the kidney often make the patient look pale and weaken. When asked if it is causing pain he replies, "No, but it makes me feel sick." Unfortunately,

regions most abundantly supplied by sympathetic nerves have not as yet been successfully blocked with local anesthetics and it is useless to speculate on what would happen if we could. True, many operators have attempted blocking of the rami communicantes, but with uncertain success. We are compelled to admit, therefore, that with respect to the shock-potent regions near the solar and sacral plexuses we have as yet no information which will enable us to determine how much could be done to prevent shock if we could block them off.

In desperate operations in which shock is to be expected, we are forced to resort to general anesthesia at least for that portion most likely to produce shock, namely that portion concerned with irritation of sympathetic nerves.

In the prevention of shock local anesthesia stands in much the same relation that it does in the control of after-pain. It eliminates the ether. Ether is not only unpleasant to the patient, but it injures and in some instances endangers him. No attempt will be made here to study the chemical effects of ether. I may say, in passing, that it is a lipoid solvent and dissolves out the cement substance between the cells to which it has access. These changes resemble those due to physical fatigue and perhaps to stimulation through the nerves. The profession is slow to convict a recognized procedure of danger or deficiency until it is sure it can get along without it. It is questionable if we should have discovered chloroform liver necrosis if we had not had ether. My own studies on the chemical effect of ether on living tissue convince me that ether is capable of harm to a degree second only to chloroform. In the vast majority we operate on patients under local anesthesia in order to save the discomforts of ether; in some instances we employ it to avoid the dangers of ether. We use local anesthesia, therefore, because it adds to the comfort and safety of the patient—both of which are attained chiefly by the elimination of ether.

Local anesthesia fails us in the essential steps in those operations which are attended by shock. Apprehension for the operation has much to do with the resistance of the patient, we admit, and hence, with the result of the operation. Sometimes, back of all that causes both apprehension and resistance, there is such a factor as constitutional disease. The effect of fear may be eliminated in some patients by local anesthesia, but it is eliminated in a greater number by the assurance that they need not go to sleep. It is the fear of that sleep that injures the patient. Nothing does so much to tranquilize a patient as the assurance that ether will not be necessary. In the desperate cases we cannot give this assurance, but it helps somewhat to say that we will go as far as we can and then give a little gas (and then ether *voce dulci*). In this way we shorten or avoid the ether, which is the essential thing. Also we must be gentle and considerate in our demeanor and in our operative technic.

Too little attention has been paid to the preparation of the patient. A case in point may illustrate this. An exceedingly nervous patient with a goiter was told that it could be removed under local anesthesia. She became much agitated and declared that she wanted to hear nothing of local anesthesia. She wanted to be asleep and know nothing about it. The anesthesia was not mentioned again. She was put to bed and told to let me know when she was ready for the operation. She was placed on bromids and after five days informed me that she was sufficiently rested to have the operation the following day. She was given 10 grains of veronal in the evening. When visited in the morning she declared she felt fine. She received morphin 1/8 grain, atropin 1/150 grain. After she was placed on the table she was told that local anesthesia would be proceeded with. She made no comment and there was not a particle of trouble with the operation.

Many who believe they are following the anoci-association method of Dr. Crile content themselves with a little aimless squirting of local anesthetic into the patient's skin and a little more into a perfectly nerveless fascia. They begin the operation before the anesthetic has had time to act. They overlook the skill and gentleness and the avoidance of ether which the originator brings to the method. The imitator is perhaps not alone to blame, for Dr. Crile himself evinces a greater faith and achieves better results than anyone else who is experienced with local anesthetics. After several years' study of the action of quinin both clinically and histochemically I am unable to understand Dr. Crile's faith. What quinin will achieve in the peritoneal fascia, aside from making the healing of the peritoneum uncertain, was not ascertained by my experiments. Without giving details of technic he states in describing his operation for thyroidectomy: "Before the wound is closed the entire raw field is infiltrated in every part with quinin and urea hydrochlorid." The raw field, in so far as infiltration is permissible (excluding the trachea, vessels and vagus nerve), is composed largely of muscle. This tissue causes no after-pain and when infiltrated with quinin exudes a reddish fluid which does not coagulate and tends to prevent wound-healing for a long time. These facts have caused me to avoid the use of quinin in thyroidectomies.

All this is looking only at the simpler phases. In those operations in which shock is likely to follow, local blocking has as yet offered nothing. The nerve distribution to the viscera is such that a deposit of anesthetic solution in their vicinity is uncertain and in the presence of adhesions and inflammatory exudates an effect on the nerves is out of question. In those instances in which it is applicable, a wait of from fifteen to twenty minutes is required before the action is complete. This delay is not without moment. True, Dr. Crile seeks to hasten its action by pressing on the area infiltrated, which, theoretically, should delay its action.

When operating with local anesthesia while the patient is asleep with gas, the operator is unable to determine whether or not the tissue is anesthetized. Bloodgood has called attention to this point. Unless the infiltration is perfect it misses its point. The gas is to serve only to prevent the patient from knowing that he is being operated on.

Dr. Crile, in speaking of the elimination of shock, admits that the patient does not always escape a dangerous depression. If, however, this depression results fatally it makes little difference whether or not there are changes in the brain-cells. By emphasizing the changes in the brain-cells, Crile removes from the term "shock" its purely clinical meaning, and substitutes an unproved histologic hypothesis. We know, as yet, too little about the termination of the nerves transmitting pain to be sure that changes found in a given nerve-cell are due to such transmitted stimuli.

Nor has an unquestionable proof of the relation of nerve-cell changes to the clinical picture called shock, yet been advanced. Local anesthesia to date has eliminated shock from those operations which can be done under its influence. In the larger operations, however, except those about the neck for carcinoma and in carcinoma of the rectum, it has not, as yet, been fully successful. In many operations, by reducing the period of anesthesia, it has reduced the tax on the patient's resistance. In the grave abdominal operations it has, so far, contributed but little. The visceral nerves, when irritated by inflammation or by the invasion of new growths, are exceedingly sensitive, and no safe method has yet been devised to prevent the transmission of these impulses to the brain. In these cases all that local anesthesia can do is to make the abdominal wall insensitive, and it seems likely that this is but a small factor in the production of shock. The prevention of shock in these cases must depend on the deftness of the operator, and his ability to judge conditions correctly in order that he may manage them with the least traumatism, in the shortest time, with the least loss of blood.

Rialto Building.

DISCOVERY OF BACTERIUM TULARENSE IN WILD RABBITS AND THE DANGER OF ITS TRANSFER TO MAN

PRELIMINARY NOTE *

WILLIAM B. WHERRY, M.D.
AND
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We wish to record our recent demonstration of *Bacterium tularense* in a fatal epizootic among wild rabbits, and to emphasize again the fact that this disease is probably widely distributed among rodents and probably transferred to man more frequently than heretofore recorded. We have demonstrated this virus in two severe cases of conjunctivitis accompanied by lymphadenitis, high fever and marked prostration. The first case of human infection has already been reported by us.[1] This case came under the care of Dr. Derrick T. Vail[2] of Cincinnati, who has reported the details of the clinical course of this case. The second case is still under the care of Dr. Robert Sattler of Cincinnati, and will be reported by him.

McCoy and Chapin first described the disease in the California ground squirrel. Naturally we have been anxious to find the source of human infection in this locality. Through the kindly cooperation of Dr. J. H. Landis, Health Officer of Cincinnati, we have been able to do so. Dr. Landis heard that rabbits were dying in large numbers in the neighborhood of Vevay, Ind. (Switzerland County). Two men were sent down, November 12, to investigate the rumor. They could not find any evidence of extensive mortality among rabbits, but they shot three and found two dead on the M. farm about 6 miles from Vevay. These were dissected, November 13, and both of those found dead were proved to be infected with *B. tularense*.

RABBIT 1.—The external appearances were normal, excepting for the presence of many fly larvae in the nose and mouth and on the skin. None of these had penetrated the tissues, so it is presumable that the rabbit was found soon after it died. On dissection the subcutaneous tissues showed some injection.

There were many small irregular areas of hemorrhage into the skin covering the posterior aspect of the hind legs and rumps. The cervical glands were congested and firm on section. The spleen was a deep blue-black and about four times the normal size and speckled all over with minute whitish foci of necrosis. The liver was congested and also showed numerous foci of necrosis. The lungs appeared normal excepting for a few patchy areas of consolidation of a deep brownish-red. The peritoneal cavity was full of a hemoglobin-tinged serous exudate.

Smears from the spleen stained with anilin (Hoffman's violet) showed numerous irregular, coccoid, encapsulated bodies resembling the involution forms of *B. tularense*.

Guinea-Pig 1 inoculated subcutaneously with an emulsion of the spleen of Rabbit 1 was chloroformed when dying on the third day thereafter. It showed the typical lesions which have been described by McCoy and Chapin, and by us.[1] *B. tularense* was isolated from the spleen of this guinea-pig on a slant of coagulated egg-yolk, while no growth appeared on control slants of plain nutrient agar and rabbit's blood agar.

RABBIT 2.—This animal showed marked post-mortem decomposition and was badly fly-blown. However, minute whitish foci of necrosis could be made out on the soft enlarged spleen and on the liver. An enlarged axillary gland was emulsified and injected subcutaneously into Guinea-Pig 3. This pig died in three and a half days, showing the typical lesions of infection with *B. tularense*.

We are anxious to help physicians in the discovery of further cases in man. It may be that physicians in country districts who have not the facilities for bacteriologic study may be willing to send us material from severe cases of conjunctivitis or lymphadenitis in man. These may well prove to be cases of this disease when there is a history of having shot or handled rabbits, squirrels or ground squirrels. A cotton swab, soaked in such exudations as can be reached, mailed to us by special delivery and accompanied by a note concerning the nature of the case will be reported on as soon as possible.

* From the Laboratory of the Cincinnati Hospital.

1. Wherry, W. B., and Lamb, B. H.: Jour. Infect. Dis., 1914, xv, 331.
2. Vail, D. T.: Ophth. Rec., October, 1914.

Conservation in Evolution.—Organisms have evolved by a trial and error method; they experiment organically, instinctively, and intelligently; above all, perhaps, in the mysterious antenatal life of the germ cells they experiment in self-expression—just as water vapour does in snowflakes, but far more subtly. What are called variations and mutations in biological language are the organism's experiments in self-expression, and these are the raw materials of progress. The organism proves all things, but the other side is that it holds fast that which is good. Great gains once made are not held lightly. Species become extinct and races perish, but important organic inventions are carried on by some collateral lineage. It was probably some ribbon worm that first manufactured hemoglobin—the all-important red pigment of the blood. Many backboneless animals of higher degree on different lines of evolution have not got it, but the invention was too good to lose; and everyone knows that it was retained on collateral lines, and that all backboned animals from fishes onward have red blood. Or again, the most primitive and in a way most puzzling kind of locomotion is that of the ameba gliding in the pond. Is it not a most suggestive fact that our health from day to day and the development of our nervous system are absolutely dependent on this self-same ameboid movement?—J. Arthur Thomson, *Brit. Med. Jour.*

Therapeutics

PREVENTION IS GREATER THAN CURE

(*Continued from page 1953*)

X

MEDICAL INSPECTION OF SCHOOLCHILDREN

The importance of this subject is evident when it is estimated that 70 per cent. of deaths in the United States are due to contagion, that the vast majority of such contagion originates in schools and that, annually, about 11,000 die of scarlet fever, about 10,000 of whooping-cough, and about 9,000 of measles.

Some considerations in the prevention of disease acquired in school are as follows:

It is estimated that each pupil should have 15 square feet of floor space and 200 cubic feet of air space. Each schoolroom should be about 30 feet long, 25 feet wide, and 13 feet high, and should accommodate not more than fifty children. Allport states that the temperature should be about 68 F., and the humidity between 60 and 70. The thermometer should hang where it will tell the truth, and the best region with this object in view is on a bracket on the inner wall about 4 feet from the floor.

The sanitary measures require proper plumbing, proper drinking facilities, proper towels, sterilization of pencils, books, etc., and antiseptic cleaning of schoolrooms. Safety requires good fire escapes and fire drills.

Medical inspection was started systematically in Belgium, and is now being gradually adopted by many of the European countries and by a large number of the cities of the United States. Perhaps more than 500 of our cities now require medical inspection. Such inspection has been shown to be a necessity and not a luxury. It has been shown that contagious diseases are more prevalent during the months when schools are in session than when there is vacation; therefore if civic and state governments compel the attendance of children at school, they are bound not to subject the pupils to an increased danger of disease and death. Hence medical inspection should be required by state laws, and about half of the states have already passed such laws. It should not be left to the petty decision of towns or cities, although the larger cities have long been pioneers in this work.

This article will not attempt to deal with the question of salaries or the best method of managing the work cooperatively with the boards of health and school boards. The medical inspectors should be selected for their ability and interest in such work, and should be paid adequately. Also, they should not be subject to removal by political changes, if their work is satisfactory.

The results of the inspection for contagion or infection should be noted on a filing card, which record should be filed separately from the cards previously described in the "physical examination," although a cross-reference on the physical examination card should be made. Later, on this contagious card, there should be noted the results of treatment and the outcome of the case.

It is not suggested or advised that there be two sets of medical men examining and inspecting in schools, but it is urged that the two kinds of work are distinct, that the latter, medical inspection, is essential, and that as much of the former, physical examinations, should be undertaken as is possible. The work can be, at least in small districts, splendidly combined.

The same care should be exercised by the medical inspector not to overstep his rights, but to refer all cases back to the parents and the family physician, as was urged in the physical examination discussion. The trained nurse of each school or each district should follow up each case of infection sufficiently to determine that the child is being properly cared for, and that the infection of others is prevented. In all cases in which a complete examination is desirable the consent of the parents should be obtained beforehand. In all cases where any examinations of girls are made, the trained nurse should be present. A private examining room in each school will facilitate and minimize the objection to such examinations.

A FEW SUGGESTIONS FOR THE MEDICAL INSPECTOR

1. The medical inspector should note the vaccination mark (present, absent, character).
2. He should note skin eruptions.
3. He should look for evidence of body or head lice.
4. He should be on the lookout for trachoma (which in some regions is of frequent occurrence).
5. The inspector should make a careful examination of every child found by the teacher or trained nurse with eruption, sore throat, a suspicious cough, or fever.
6. He should examine all other children who are in immediate contact with the one who is ill or is found to have a contagious disease.
7. He should examine all other children who live in the same house as the one affected and who are attending school.
8. He should cooperate with the board of health to determine when a cured child should return, and when suspects should be subjected to, and when they should be released from quarantine.
9. When there is no physical examination of all children in a school as previously outlined, the inspector should make as much of an examination of apparently unhealthy children as possible. The important objects to be determined are: the condition of the teeth, nose, throat, eyes, ears, spine, feet, ankles, glands, heart, lungs, nutrition, mental condition, etc.

NUTRITION

Medical inspection should really be medical supervision at least with the aid of the trained nurse, and a great problem of child health and of prevention of disease is that of nutrition. Underfed children are in goodly numbers, as shown by such statistics as are available, and for such the question of the diet at home is important, especially the breakfast. The homes and diet of all ill-nourished children should be investigated by the trained nurse. The value of the school luncheon is unquestionable; however, its advisability must be determined by each community, but the actually underfed children must in some manner be provided with good food. There is no possible excuse for compelling a child to study who is receiving insufficient food.

EYES

A very large percentage of children of school age are found to have defective eyes. Such defects being discovered, how many receive the proper glasses, and then how many keep their glasses properly adjusted, and how many have reexamination as often as they should (such examination should be once a year)

to determine the changes that will occur? It is readily seen that the eye question is a serious one.

As many children as possible, who have been found to have defective eyes and eye-strain, should be sent by their parents to oculists of repute, and the danger of consulting opticians and so-called optometrists and department store eye clerks should be explained on a printed slip issued by the board of health or the school board. This paper should also urge that the child have spectacles with large sized lenses and rigid, light weight, inexpensive frames. There is no other method to equip an astigmatic eye properly, especially in children. All other frames, for a child, are a delusion and a snare. If a family can afford it, "dress up" gold or gold-filled frames may be had as an extra pair. Each child with glasses should have a good case for them, and in all rough games the glasses should be taken off and deposited in these cases and the cases placed in a safe spot. This detail may seem superfluous, but it is all-important.

If the visiting nurse ascertains that the parents are unable to pay for a skilled oculist's examination, or for the lenses, then the child should be sent to a regularly appointed oculist who receives a small salary for such services. Later the prescription for glasses should be taken to a regularly appointed optician or one of several who have contracted at minimum rates for such cases. Dispensary service for determining the correct refraction of a child's eyes for his life work is unsatisfactory and generally unavoidably bad. A child had better have no glasses at all than to have incorrect ones. Neither should it be expected that the oculist can devote time and science, unpaid, to such a nerve-tiring work as determining the proper glasses for children. They are willing to do emergency and eye disease work for the poor gratis, but eye refraction work should be paid for. Why should a community demand that a child go to school and then demand that some member of the community, without pay, make the child fit to go to school? On the other hand, the correction of eye-strain in children not only causes them to learn with more ease, but prevents eye defects that may mean untold suffering for years after. The migraine sufferers will certify to the correctness of this statement.

TOBACCO: ALCOHOL

There is no question that during the teaching of school hygiene, during the study of physiology in school, and during the brief description of the action of, and the antidotes to, the more common poisons, the baneful effects of tobacco and alcohol should be honestly shown. It is of no more advantage to disseminate lies in regard to these narcotics and habit-forming substances than to teach any other branch of knowledge incorrectly. The truth is bad enough.

It is inexcusable for parents to give young children alcohol, but it is not wise to teach children that because their parents occasionally partake of a glass of beer or wine, they are condemned to perdition physically and morally. The higher standards of communities and the proper supervision of all places that sell liquor that is to be drunk on the premises will soon make overdrinking unusual except in the diseased. The moderate use of alcohol by adults must for some time be a matter for individual decision. Youth and those under age should not take alcohol in any form, not even tinctures or caffein stimulants at the soda-water fountains.

Much more serious for the many among our young boys and young men is the overuse of tobacco. Where one young man uses alcohol perhaps twenty use tobacco. Cigaret smoking in young boys is tolerated in some preparatory schools, and even in some public high schools. In fact, a large number of young men under 21 years of age smoke excessively and to their detriment mentally and physically.

The symptoms and signs of oversmoking, the impaired chest and lung development, the impaired heart action, the impaired nutrition, injured nerves and weakened muscles are all matters of medical knowledge. These vary only in degree in young boys who overuse tobacco, and are all more or less in evidence sooner or later. Emphatically, growing boys should not be allowed to smoke, even if their fathers and teachers do.

(*To be continued*)

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED BY THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION. THEIR ACCEPTANCE HAS BEEN BASED LARGELY ON EVIDENCE SUPPLIED BY THE MANUFACTURER OR HIS AGENT AND IN PART ON INVESTIGATION MADE BY OR UNDER THE DIRECTION OF THE COUNCIL. CRITICISMS AND CORRECTIONS ARE ASKED FOR TO AID IN THE REVISION OF THE MATTER BEFORE PUBLICATION IN THE BOOK "NEW AND NONOFFICIAL REMEDIES."

THE COUNCIL DESIRES PHYSICIANS TO UNDERSTAND THAT THE ACCEPTANCE OF AN ARTICLE DOES NOT NECESSARILY MEAN A RECOMMENDATION, BUT THAT, SO FAR AS KNOWN, IT COMPLIES WITH THE RULES ADOPTED BY THE COUNCIL.

W. A. PUCKNER, SECRETARY.

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Laboratory of W. T. McDougall, Kansas City, Kan.

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SATURDAY, DECEMBER 5, 1914

VOLUNTARY ACCELERATION OF THE PULSE-RATE

It is doubtless true in the case of most persons that they are unable to render many of their important physiologic functions subject to the action of the will. The performances of the alimentary tract proceed without our knowledge and independent of any volition on our part. The heart carries on its duties in the maintenance of the circulation with persistent efficiency and without interruption. The contraction of the cardiac organ is modified by impulses that come to it from within and without; but these regulatory impressions are rarely the direct product of the human will.

There are persons, though they seem to be exceptional and few in number, who can exercise a voluntary regulation of the heart-beat. Tarchanoff,[1] in 1885, observed a medical student who could alter his pulse-rate at will. He found that men with this faculty had generally an exceptional control over their skeletal muscles; for example, they could bend the third joint of a finger independently of the other joints, or contract the platysma muscle, or certain individual groups of the muscles of the arm and neck. In the case observed by Pease,[2] the subject could voluntarily accelerate his pulse-rate as much as twenty-seven beats per minute and likewise exhibit the control over other muscle groups just referred to.

It is, of course, a well-known fact that the cardio-regulatory centers can be affected by stimulation of afferent nerves, and can be influenced experimentally from the cerebrum or by the action of the blood on the centers. The frequency of the pulse can be altered by psychic and emotional states. Thus in many persons it may be slowed by directing attention to the contemplation of painful subjects. The mere physical examination on the part of a physician may give rise to a familiar acceleration of the pulse. In the case of an individual counting his own pulse its frequency may even become diminished. In conditions of hypnotism, the pulse-rate has been observed to change markedly under the influence of suggestion. All such instances, however, belong in quite a different category from the direct voluntary acceleration of the heart-beat in man to which we have particularly referred.

What is probably the most carefully recorded illustration of this anomalous behavior has been described by Koehler, a student in the physiologic institute at Strassburg, who is able to increase his pulse-rate as much as twenty beats per minute by the impulse of his will.[3] He remarks that the mere concentration of his attention on the activity of the heart is not of itself sufficient to produce the acceleration. The mere "will" to increase the pulse-rate must be accompanied by an indescribable mental effort which is comparable with that whereby we provoke a contraction of our voluntary musculature—a voluntary effort, it might be designated. In order to accomplish the feat it is essential, in Koehler's case, to avoid the distractions which noises, unusual sights and similar stimuli playing on the sense organs may create. Although he can almost invariably succeed in evoking the acceleration, he is utterly unable to induce a slowing of the pulse-rate by an act of will. In his case there is reported to be a lack of the peculiar temperament or neuromuscular make-up which has been described for others. During the voluntary acceleration of the heart-beat no unusual physiologic or mental peculiarities appear. There is no blushing or sweating which might suggest a greatly altered vasomotor response. Only when extreme effort to accelerate is attempted do special muscle groups show any subjection to the peculiar voluntary control. At these unusual moments of most intense "willing," slight shivering or trembling of muscles in the neck or arms may be exhibited. A striking phenomenon is the evident dilation of the pupils. A sensation of indefinable discomfort and intrathoracic pressure makes itself felt; but practice in the voluntary acceleration—a performance against which Tarchanoff uttered a warning on account of its supposed danger—makes these symptoms less emphasized.

The mere description of an unusual physiologic or anatomic phenomenon has a restricted value unless it can serve in some way to enrich our knowledge of normal or abnormal function. A careful clinical examination of Koehler by Wenckebach of Strassburg failed to disclose any unusual condition of the heart at any time. There were no irregularities of the beat or changes in the working capacity of the heart. The acceleration of the pulse was always accompanied by changes in respiration and increased blood-pressure, but the latter is not to be looked on as a cause of the acceleration. Indeed, a primary rise in blood-pressure is much more likely to result in a decrease in pulse-rate, as a general rule.

1. Tarchanoff: Arch. f. d. ges. Physiol., 1885, xxxv, 109. There are also earlier cases on record.

2. Pease: Boston Med. and Surg. Jour., 1889, cxx, 525. Another case was observed by Van der Velde: Arch. f. d. ges. Physiol., 1897, lxvi, 232.

3. Koehler, M.: Ueber die willkürliche Beschleunigung des Herzschlages beim Menschen, Arch. f. d. ges. Physiol., 1914, clviii, 579.

All of the cases of rapid heart action of other than reflex origin raise the question of the immediate cause of the acceleration. Is it due to a diminution of the tonic activity usually exerted by the inhibitory vagi over the heart, or is it attributable to a direct action on the centers of the accelerator nerves? The earliest careful investigator[1] of the phenomenon of increase in heart-rate in man drew the conclusion that the voluntary acceleration was due to the accelerator nerves. In an exhaustive study of the acceleration of the mammalian heart, Reid Hunt[4] came to the conclusion that the evidence for this view is entirely inconclusive. He is inclined to think that the weight of the evidence is rather in favor of the existence of a diminished tonus of the vagi in these cases. According to Hunt, the most important function of the accelerators appears to be connected with their tonic activity; and almost all cases of rapid heart action seem to be due to a diminution of the tonic activity of the cardio-inhibitory center. Koehler, on the other hand, is inclined to place the emphasis on the participation of accelerator nerves, the stimulation of which he looks on as the essential factor in the genesis of voluntary rapid heart action. The contributory influence of a diminished vagus activity is admitted.

THE FLIGHT OF FLIES

One of the problems that has arisen in connection with the part played by insects as carriers of disease[1] concerns the distance which they may be able to travel from one locality to another. This has frequently been considered in this country in connection with mosquitoes which are responsible for the prevalence of malaria. With their breeding-places known, it has become desirable in some cases to ascertain what the range of their activities might be in respect to the territory which can be covered by insects so small as are the blood-sucking *Diptera*. It has been learned in this connection that some of the mosquitoes which inhabit salt marshes near the seacoast may be found inland at a distance as great as three miles.

Far less appears to be known with regard to the migrations of the common house-fly, *Musca domestica*, an insect that has been charged with responsibility for the spread of typhoid fever and other infectious diseases. A series of studies conducted in Cambridge, England, on the range of the flight of flies of this species has been made the subject of a report to the Local Government Board on Public Health and Medical Subjects.[2] Upward of 25,000 flies were liberated, under various meteorologic conditions, from the medical buildings at Cambridge. Of these insects, colored for identification, 191 were recovered at one or other of about fifty observation stations employed for their recovery. The results showed that house-flies tend to travel either against or across the wind. The actual direction followed may be determined either directly and by the action of the wind, or indirectly owing to the flies being attracted by any odors it may convey from a source of food. A point in favor of this supposition is the nature of the station at which flies were recovered after they had traveled any distance. These comprised a butcher's shop, public houses and a restaurant, all of which gave off odors that are notoriously attractive to flies. The chief conditions favoring the dispersal of flies are fine weather and a warm temperature. The nature of the locality is another considerable factor, because in towns flies do not travel as far as in open country, probably due to the food and shelter afforded by the houses. With regard to the altitude of the point of liberation, flies set free from the roof tended to disperse slightly better than those liberated from the ground, but the differences are not very considerable. It has been observed, with regard to the vertical flight of the house-fly, that it may mount almost directly upward to a height of forty-five feet or more. The time of day appears to influence the dispersal of the insects, as, apparently, when set free in the afternoon they do not scatter so well as when liberated in the morning.

The maximum flight observed in the thickly housed localities in Cambridge was about a quarter of a mile. In one case, where a part of the distance was across open fenland, a flight of 770 yards was noted. In experiments conducted in Cook County, Illinois, by S. A. Forbes, flies were trapped and, after being sprayed with a chemical solution for recognition, were liberated from a hospital in that district. They too were recovered at distances ranging up to a quarter of a mile from the point of liberation.[3] It appears most likely that the distance flies may travel to reach dwellings is controlled by circumstances. Almost any reasonable distance may be covered by the fly under compulsion to reach food and shelter.

It has been stated that house-flies, like other insects, exhibit color preferences. Thus it is reported that a French observer, having noticed that flies did not rest on walls covered with blue paper, blue-washed the walls of his milk house and found that insects did not visit them. A recent statistical study of the behavior of the insects in this respect has failed to bring evidence that the flies display any marked color preference.[4] Therefore it seems unlikely that the adoption of any particular color for walls will have any effect on the numbers of flies entering.

4. Hunt, Reid: Direct and Reflex Acceleration of the Mammalian Heart with Some Observations on the Relations of the Inhibitory and Accelerator Nerves, Am. Jour. Physiol., 1899, ii, 369.

1. Flies as Carriers of Disease, editorial, THE JOURNAL A. M. A., Nov. 7, 1914, p. 1647.

2. Report to the Local Government Board on Public Health and Medical Subjects, 1913, New Subject Series, No. 85, pp. 20-41. This is reprinted by Hindley, E., and Merriman, G.: The Range of Flight of Musca Domestica, Jour. Hyg., 1914, xiv, 23.

3. Howard, L. O.: The House Fly, New York, F. A. Stokes Company, 1911, p. 56.

4. Hindle, E.: Note on the Colour-Preference of Flies, Jour. Hyg., 1914, xiv, 46.

MEDICAL HISTORY IN THE MEDICAL CURRICULUM

At a meeting of the Königsberg Society of Scientific Medicine, May 18, Prof. Egbert Braatz,[1] who holds the chair of surgery in the Königsberg Faculty, indulged in sundry well-timed lucubrations on the decline of historical studies in medical education. As we can better understand the function of an organ if we know its embryology, which knowledge has, in itself, a history of its own, so, he points out, the real significance of many ideas and expressions current in modern medicine would be more clearly apprehended if we understood their remote origins. Not only does the interest in the history of medicine vanish day by day, he laments, but the swarm of teachers of the earlier type, who taught the subject as a distinct discipline, has also entirely disappeared. The reason is that the older universities taught the universal relationship of all the sciences, so that an old-time professor, who took nearly all medical knowledge for his province, usually "holding down" several chairs at once, was naturally in position to study and write on medical history. Nowadays medical science is split up into a large number of separate disciplines and specialties, to master any one of which is a sufficient life study for the average individual man. Hence, the specialist knows only the history of his specialty and seldom goes outside it. Furthermore, Braatz argues, the young student cannot, in the nature of things, have any interest in the history of a subject so vast that, on taking his degree, he has only just begun to learn it. It is idle to set final examinations in medical history when no adequate instruction can be given without impinging on studies of more immediate and practical moment. To obviate this, Braatz prefaces his own lectures with a sketch of the actual state of knowledge of the subject in hand, in order to close with its history. To this end, especially striking themes are always chosen. In some of the discourses introductory to the semester, a short general historical introduction is given. As an example of the practical value of his method, Braatz cites one of his lectures, "On the Treatment of Mammary Tumors," in which the ebb and flow of the different theories bearing on the unsolvable cancer problem through the ages is considered.

In discussing Braatz' paper, Prof. Carl Kaiserling, director of the Pathological Institute, states that the author opens an old wound, painful to all. Instruction in medical history is usually confided not to a specialist in the subject, but to a docent in some other branch, such as pathologic anatomy. To teach such a subject as pathology in all its theoretical and practical bearings is all that a modern professor can do. Who has time to study medical history as a modern should know it? It seems right and proper that our "historical sense" should be concentrated on the modern aspects of any subject. Who can even engage to keep up with the modern literature, when there are almost as many periodicals as days in the year? Historical interest in a subject can be aroused only when the latter has been thoroughly mastered in its present aspects. Hence, the study has to be postponed until the end of the student's course, or even after he has entered on the practical business of his life. The young student would undoubtedly be hindered by the introduction of prosy historical lectures at the beginning of his course. Kaiserling approves of Braatz' method, because by it, the instructor intertwines historical matter with his special subject.[2] Much of this might be connected with etymology, the bugbear of the beginner, only, alas, there are teachers as well as students who know no Greek. In further discussion of the paper, Professor Kisskalt opines that the history of epidemiology, as relating to the unsolved problems connected with the appearance and disappearance of infectious diseases, would be of a special interest, as also the history of errors in medicine. Professor Friedreich, of the University Clinic, testifies that he has aroused enthusiasm in his students by bringing historical matter directly into his clinical demonstrations.

We cannot too warmly commend the foregoing as the best method of teaching medical history in the student's curriculum. The history of ancient medicine is a dull subject in itself; the modern period, from the work of Vesalius and Harvey on, is the most inspiring, as Kaiserling hints, and long-winded lectures, by no matter what authority, would only crowd the medical course still further with material which could not be assimilated.

Probably the best lectures of the kind delivered in this country were those of the late Dr. J. S. Billings on medical history in relation to medical education, which were delivered at the Johns Hopkins University in connection with the proposed building of its hospital and the formation of its medical school. Yet neither these lectures nor those subsequently delivered by Billings at the Lowell Institute were considered worthy of publication by their author, probably because they dealt with material "gone stale," even though viewed from a special angle. But the seed thus sown did bear fruit. At the Johns Hopkins Hospital, Osler and the other professors carried "historical medicine" directly into the clinics, much in the manner which Braatz has adopted and described. And this way of familiarizing the student with the rudiments of the subject might easily be followed by the anatomist, the embryologist, the otologist, the professors of hygiene and medical jurisprudence, and other teachers in the different specialties.

1. Braatz, Egbert: Deutsch. med. Wchnschr., 1914, xl, 1879.

2. In seiner Spezialwissenschaft historische Einflechtungen macht.

THE FAT CONTENT OF THE BLOOD

Judging by the attention which is being devoted of late to the quantitative aspects of the blood, we may look forward with considerable confidence to a better understanding, in the near future, of the economy of the nutrients in their exchanges between the circulating medium and the body tissues. Some of the constituents of the blood have already been the subject of extensive investigation, notably the sugar and the non-protein nitrogenous substances regarding which we have offered comments from time to time.[1] The sugar-content of the blood is coming to rank with other more familiar quantitative constants like the percentage of hemoglobin or the number of corpuscles, as an index of the existence of pathologic conditions in the metabolism of the body. Urea estimations and other ways of determining such non-protein nitrogen as is furnished by amino-acids in the circulation are being studied in relation to the efficiency of the kidneys as organs of elimination.

Surprisingly little has developed with respect to a different group of blood constituents, the fats, which are quite as common, if not actually as indispensable, as sugar in the nutritional performances of the organism. Lipemia — characterized by an exceptional amount of fat in the blood — is familiar to most physicians as something occurring during fat absorption, when the blood-plasma becomes milky with fat. It is a phenomenon likewise frequently present in severe diabetes.[2] Whereas, however, it is not uncommon to refer to hyperglycemia or hypoglycemia, to uricacidemia, to uremia, etc., somewhat familiarly, attention has only recently been directed to the probable importance of variations in the character and amount of the fatty constituents of the blood. Even the "constants" with respect thereto are scarcely known with any degree of either accuracy or adequacy.

Equipped with a novel method of investigation, based on nephelometry, Dr. W. R. Bloor, recently appointed to the staff of the Harvard Medical School from the laboratories of biological chemistry of Washington University at St. Louis, has approached the problems of the fat-content of the blood under approximately normal conditions.[3] Obviously, we need to understand the variations that may be expected therein before it will be profitable to engage in any elaborate consideration of the perversions that occur or their pathologic meaning. Perhaps the most significant feature of these newest studies is the fact that the fat-content of the blood of dogs is shown to be quite constant both for the individual and the species. The average figure for what may be called the fat-content of the blood under normal conditions, taken at varied times on samples collected twenty-four hours after the last feeding, was 0.6 per cent. The average variation of any animal from the average for all was only 7 per cent.; the greatest variation, 14 per cent. This plainly indicates that there is an efficient regulation. Bloor concludes that this constancy of fat values in the blood of dogs gives sufficient reason to expect a similar constancy in the normal blood-fat value of human beings, and indicates that blood-fat determinations would give valuable diagnostic information in certain conditions.

Feeding fat in the ordinary way caused an increase in the fat-content of the blood beginning in about one hour after feeding and reaching a maximum in about six hours. When the thoracic duct was tied there was no increase in blood-fat after fat-feeding. This does not necessarily prove that no absorption was taking place, but only that if any fat was entering the blood-stream by channels other than the lymphatics, it was being removed as rapidly as it entered.

In connection with recent attempts at the intravenous feeding of fats in the form of the fine emulsion furnished by egg-yolk,[4] it is interesting to learn that the fat in certain types of emulsions may disappear rapidly from the circulation after it is introduced directly into the blood-stream. Why there should be wide variations in their behavior is not yet clear. The point of chief import, we conclude, is the possibility of a rapid removal of even undigested fat to the storage or other depots concerned in fat metabolism.

It has long been understood that the amount of fat in the blood may be somewhat increased in fasting, because the fat is taken up from the fat deposits and carried to the various organs by the blood. The experiment has not always tallied with the theory, however. From Bloor's investigations it is not unreasonable to explain the differences hitherto observed—sometimes a high and again a low blood-fat content in starvation—by the relative availability of the stored fat and especially the fat in the temporary storehouses on the one hand and the rate of utilization on the other. For example, an animal which did not ordinarily show any increase in blood-fat in fasting, was made to exhibit the usual curve of increase of blood-fat in fasting by stuffing with fat-food for a week before the fast. Bloor's results thus plainly indicate that when food is withheld, the increase in blood-fat depends on the nutritional condition of the animal. Narcotics may also have a pronounced effect on the blood-fat content; but that is a topic which demands more study.

1. The Sugar Content of Human Blood, editorial, THE JOURNAL A. M. A., April 4, 1913, p. 1228; Blood-Sugar in Diabetes, Current Comment, ibid., Aug. 9, 1913, p. 418; Variations in the Content of Sugar in the Blood, editorial, ibid., Jan. 10, 1914, p. 131; The Amino-Acids in the Blood, Current Comment, ibid., Feb. 21, 1914, p. 621; The Absolute and Percentile Amounts of Sugar in the Blood, editorial, ibid., Sept. 19, 1914, p. 1036.

2. An Explanation of Lipemia, editorial, THE JOURNAL A. M. A., Oct. 3, 1914, p. 1208.

3. Bloor, W. R.: A Method for the Determination of Fat in Small Amounts of Blood, Jour. Biol. Chem., 1914, xvii, 384; Studies on Blood-Fat. I. Variations in the Fat-Content of the Blood under Approximately Normal Conditions, ibid., 1914, xix, 1.

4. Schott: Deutsch. Arch. f. klin. Med., 1913, cxii, 403.

RURAL SANITATION

In 1909 the Commission on Country Life reported that "the farm should be the most healthful place in which to live, and there are numberless farmhouses, especially of the farm-owner class, that possess most excellent modern sanitary conveniences. Still it is a fact that there are also numberless other farmhouses, especially of the tenant class, and even numerous rural schoolhouses, that do not have the rudiments of sanitary arrangement. Health conditions in many parts of the open country, therefore, are in urgent need of betterment."

The problem of rural sanitation calls for consideration from two points of view: that of the possible danger of objectionable surroundings and unhygienic practices to the individual on the farm and his immediate neighbors; and that of the menace which insanitary farm conditions may present indirectly to urban communities. The sanitary relation of the farm to the city involves almost entirely the possibility of the spread of actual infection from country to city through milk, meat, vegetables and other farm products. A few years ago it was not uncommon for farmers to meet with a spirit of resistance any suggestion of hygienic improvements which were planned to diminish the danger of the farm as a starting point for the spread of disease. At times there has actually been aggressive opposition to proposed regulations the object of which was defensible from every unbiased point of view. The milk industry could furnish many instances in recent times of actual refusal on the part of farm communities to supply an essential food to the market under conditions that to-day are everywhere accepted as rational and necessary.

A few years ago the apparent indifference of the rural community to the needs of the urban population dependent on the farm for a healthful food supply could be excused on the basis of ignorance. To-day there is no excuse for apathy toward the teachings of modern sanitation. The campaign of education that is being waged throughout the United States by all manner of forces—municipal, state and national—by agencies connected with the Public Health Service, the Department of Agriculture, the experiment stations, the state universities, boards of health, civic organizations and the public press ought to win its way into every rural home that has any ties whatever with civilized communities.

The better understanding of the farmer's unavoidable responsibility toward his distant fellow citizen has in turn reacted to advantage in respect to his own environment. As a recent writer has expressed it: Fortunately with the general advance in rural standards of living in recent years there has come about a considerable awakening of interest among farmers and representatives of rural communities along these lines, as well as among the public as a whole. Modern methods of communication and travel have to a great extent brought the rural districts into closer relationship with the towns and cities. The farmer learns of the improved general health and reduction in the death rate resulting from the decrease of the ravages of contagious disease, which has been brought about through the introduction of such preventive measures as a sanitary water supply, proper methods for the disposal of sewage and garbage, and mosquito and fly extermination, and wishes to avail himself of these benefits.[1]

The country medical practitioner well realizes the futile idealism of much that emanates from an urban desk. Sometimes the most elementary sanitary conditions offer puzzling problems when the expense and feasibility of the proposed remedies are carefully studied. Too often the city reformer forgets the enforced monotony of diet, the lack of recreation and the excessive hours of work which farm conditions may entail in some sections and at certain seasons. There are social as well as economic forces involved in farm life. The reform of rural sanitation, which is undeniably called for in some parts of the United States, must not overlook the personal element so strong in the country dweller. With the exigencies of the situation kept in mind the campaign for improvement in rural sanitation is likely, in the words of a recent writer, to do much to make farm life at once more profitable, more healthful and more attractive, and by so doing contribute to safeguard the food supply, and therefore the health and the efficiency of the nation.

Current Comment

FUNCTIONS OF A CITY HOSPITAL

A pamphlet issued by the Department of Public Welfare of the City of Cleveland deals with the history, functions and possibilities of the Cleveland City Hospital. The following statement indicates that those in charge of this hospital have a clear conception of the invaluable service to the public which can be rendered by a great municipal hospital if properly conducted: "A municipal hospital is an institution of organized society provided by a city to care for the sick. It is but a medical means to a social end, and this end — public welfare — must never be forgotten. The modern hospital has outgrown the narrow field of boarding and treating sick people, and the time has come when a proper city hospital can no longer passively receive the sick from the community at large, without regard for the reason why they became sick, use them chiefly as material and often discharge them without the slightest interest in their convalescence and rehabilitation in wholesome living and working conditions. Hospitals more than any other social agency accumulate the evidence against the

1. Editorial, Expt. Sta. Rec., 1914, xxx, 701.

dangers to life in the community, dangers from contagion, from ways of living and from industry, and they must feel the responsibility to study this evidence and become leaders in the progress of prophylactic medicine. The idle convalescent is of no more value in a community than the bedridden and scarcely less expensive to support. It is not only charity and social service, but also sound economy for a city to supervise convalescence; to make it such that the patient can return to his work the sooner. A city hospital of to-day must continue to give to a community scientific care for its sick and must afford opportunities both for scientific investigation and for the education of physicians, nurses and orderlies. But above all, it must, through its social service work and through cooperation with all other community social agencies, give a watchfulness over public health and results that will result in more days of life, work and happiness to its citizens."

DO "PATENT MEDICINE" INTERESTS CONTROL THE PRESS?

Most of our readers are familiar with the "Great American Fraud" articles by Samuel Hopkins Adams that appeared in *Collier's* a few years ago. In preparing the matter for the "Great American Fraud," Mr. Adams visited "patent medicine" factories, got in touch with nostrum promoters — and their dupes — and in various ways investigated the subject with the utmost thoroughness. In connection with that series there were one or two articles showing the sinister control that the "patent medicine" interests exercised over the press of the country. The notorious "red clause" in advertising contracts, by which the "patent medicine" makers hoped to enlist the aid of the newspapers as unpaid lobbyists against any proposed health legislation that might interfere with the sale of nostrums — this is history. That the "patent medicine" interests still exercise a baneful control over the press is evident from the facts brought out in a letter from Mr. Adams published in this issue.[1] In his latest novel, "The Clarion," Mr. Adams has put in vivid and gripping form the information he has gained as a newspaper man, and his wide and yet detailed knowledge of quackery and the "patent medicine" business. It is not necessary here to give a synopsis of "The Clarion"; this was done when the book was reviewed recently.[2] It is sufficient to remind our readers that the novel deals with the problems that beset a newspaper that tries to be honest with its patrons. The chief character in "The Clarion" is a "patent medicine" manufacturer, one "Dr. Surtaine," whose nostrum "Certina" brought him wealth and power. Readers familiar with the history of contemporary quackery will recognize in Surtaine a composite picture of several individuals who have amassed wealth through the sale of worthless, fraudulent or dangerous nostrums. If one wished to clothe the intangible, to particularize the general, to materialize the immaterial, he could, as fancy led him, recognize in Mr. Adams' hypothetical nostrum "Certina," such products as "Swamp Root," "Peruna," or a score of others. It is evident from Mr. Adams' letter that the newspapers and book-store proprietors of Binghamton, N. Y., have materialized "Dr. Surtaine's" preparation in the notorious fraud, "Swamp Root." Such might have been expected. But it is a little disheartening to those who were hoping against hope that the newspapers were throwing off the yoke of the "patent medicine" makers, to find that there are still newspapers so recreant to their public trust as to refuse to advertise a novel because it may throw an unpleasant light into the dark places of a local industry.

1. Page 2062.
2. See THE JOURNAL, Oct. 10, 1914, p. 1316.

FURTHER "PATENT MEDICINE" INFLUENCE

In connection with the instance cited above we give another example of the power wielded by the "patent medicine" interests. The story runs that a traveling exhibit sent out by a state board of health contained, among other material, some educational posters on the "patent medicine" evil. One of the placards exposed the fraudulence of a "patent medicine" manufactured and having a large sale in that section of the country through which the exhibit was going. Soon after the traveling exhibit had left the town in which this particular medicine was made, the official in charge of the exhibit received a telegram from a railroad official of another state requesting that the particular exhibit in question be removed from the car because it reflected adversely on a certain one of the railroad's patrons. As the request practically amounted to a demand, the exhibit objected to was removed. This particular incident we may take up in greater detail at some future time; at present it is referred to only to show that the influence wielded by those who have made their millions out of the great American fraud is as real as it is malevolent.

BARE WALLS AND MONOTONY

The bare white walls of the modern sanitary hospital have a certain monotony which, in many instances, forms a dull and dreary aspect to the sick person who must lie for the larger part of every day and find nothing else in his horizon. Brayton[1] refers to a patient who, when he left the hospital, said: "Sister, tell the next patient who occupies this room that there are 391 fleurs-de-lis in the decoration on the wall." Another patient reported to his friends that his room was well aired by two large windows, that there were three fly-specks on the big white walls, and the brass door knob was most interesting. In Indianapolis two units of the City Hospital, known as Burdsal units in honor of the founder, have been decorated so adequately that the foregoing criticism does not apply. Some of the best artists — men and women of national fame — have collaborated in the work. Mr. William Forsythe is general director of the decoration program, and is personally decorating one of the wards for the children. In the children's dining room Mr. Otto Stark has portrayed a "festival of toys." In one of

1. Brayton: Indianapolis Med. Jour., 1914, xvii, 497.

the corridors of the children's wards Mr. Carl Graf has illustrated the story of Cinderella. Mr. Weyman Adams, a well-known portrait painter, has included twenty-four portraits of Indianapolis children placed medallion-like in panels between the windows. In the sun parlor the best-known children stories have been depicted in colors by Mr. Clifton Wheeler. In the women's wards work is being done by Mr. T. C. Steele, Mr. J. Otis Adams, Mrs. J. E. Bundy, Mr. William E. Scott and Miss Dorothy Morlin; corridors and panels are being made by Mr. Martinius Anderson and Mr. G. Gaus. A large bronze fountain is being made by Mrs. Myra Richards for the roof garden playground, and a bronze tablet, commemoratory to the donor, by Miss Helene Hibben. A visiting artist, looking over the walls already covered, remarked that there were only two buildings in this country that these decorations recalled, one of them the Boston Public Library, the other, the Congressional Library. The idea, while not wholly unique, has here been carried out with a quality and completeness probably not equaled elsewhere. As Brayton quotes, "These beautiful and peaceful decorations 'may minister to a mind diseased and pluck from memory a rooted sorrow.'" The achievement is worthy of being widely copied if other communities can enlist a similar cooperation of artists.

THE SIGNS OF DEATH FROM FREEZING

It is not clearly understood how severe cold causes death. A variety of causes have been assumed to be at work — accumulation of carbonic acid, paralysis of the vasomotor centers, loss of heat, accumulation of blood in the heart, anemia of the brain, destruction of red corpuscles — all of which tends to show that we really do not know anything definite as to the precise cause. The signs of death caused by exposure to cold are also poorly understood. This is especially unfortunate in view of the fact that in all northern countries cases of death from freezing frequently present themselves for investigation. In Russia, for instance, at least several hundred persons die each year from the immediate effects of severe cold, and in the Medico-legal Institute in Moscow about 2.5 per cent. of all post-mortem examinations concern deaths from freezing. Recently Krjukoff[1] has published the results obtained from a study of the Moscow material with a reference to the signs of death from freezing, and he finds that in 40 per cent. of the cases the presence of swollen and glistening bluish-red or bright scarlet-red spots in the skin of the ears, hands or feet were present and that such spots are reliable signs of the action of cold on the living skin. Cerebral and pulmonary hyperemia and edema were frequently found, and the heart commonly was overfilled with blood; but these appearances were not distinctive. Hemorrhagic erosions were found in the stomach in 72 per cent. Krjukoff regards the absence of glycogen and sugar in the liver as a good sign of death from freezing, particularly valuable because both these substances are present in the liver in acute alcoholism.

1. Krjukoff, Alex., Vierteljahresschr. f. gerichtl. Med., January, 1914.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

Personal.—Dr. Wesley Earl Drennen, Birmingham, has sailed for Europe.——Dr. George H. Fonde, Mobile, has been appointed a trustee of the Alabama-Bryce Hospital for the Insane, Tuscaloosa.

Fire in Infirmary.—Fire at the infirmary of Drs. Luther L. and Robert S. Hill, Montgomery, November 7, caused serious damage, and necessitated the removal of all patients from the building. This was accomplished without casualty.

Tick Eradication.—Dr. J. A. Kiernan is working on this task for the federal government. Hale, Marengo and Henry counties voted for tick eradication in the last election. Wilcox County is to furnish funds for tick eradication work. Limestone County has entered into a contract with the federal government to assist in tick eradication beginning Feb. 15, 1915. The Alabama Live Stock Sanitary Association has also entered into a tick eradication contract.

Malarial Survey.—Surgeon Rudolph H. von Ezdorf, U. S. P. H. S., has recently been transferred from Mobile to New Orleans and delivered an address at a meeting of the Mobile County Medical Society on "Malarial Survey," in which he outlined the ways in which surveys are made by the public health service in the various cities affected by malarial mosquitoes. A resolution, commending the faithful work of Dr. von Ezdorf during the four years of his stay in Mobile, was adopted by a rising vote.

CALIFORNIA

Want Another Tuberculosis Hospital.—The committee on public health of the San Francisco Medical Society has recommended to the supervisors that the present tuberculosis hospital be used for bed cases only, and the city requires a sanatorium for ambulatory and hopeful cases of tuberculosis.

Personal.—Dr. Frank J. Bailey, Red Bluff, has been elected coroner and public administrator of Tehama County.—Dr. Howard Somers, San Francisco, has returned from Europe. ——Dr. Edward E. Dowdle has resigned as resident physician at the Oakland Emergency Hospital and will locate in Hayward.

FLORIDA

State Laboratory Opened.—The State Bacteriological Laboratory at Tallahassee was opened last week.

State Colony for Epileptics.—A campaign for the establishment of a state colony for epileptics in Florida was started in August last, by a series of popular articles which appeared in the Jacksonville *Times Union* in the form of an appeal to the State Board of Charities and Corrections and the charitable and philanthropic people of the state.

ILLINOIS

Life Memberships Conferred.—At the forty-first annual meeting of the North Central Illinois Medical Society held in Wenona, December 1 and 2, certificates of life membership were conferred on Dr. George Allen Dicus, Streator, president of the association; Dr. Thomas H. Trainor, Aurora, and Dr. Thomas W. Burrows, Ottawa.

Personal.—Dr. Enos S. Spindel, Springfield, has been appointed a member of the State Board of Health, vice Dr. James J. Hassett, McLeansboro, deceased.——Dr. Thomas N. Miller, Rockford, who was seriously injured in a runaway accident November 2, is reported to be convalescent.——Dr. Halley A. Smith, Rockford, has started for France where he expects to serve in the army medical corps.

Chicago

Civil Service Examination.—The County Civil Service Commission announces that it will hold an examination the last week in January, 1915, for director of the Psychopathic Institute in connection with the juvenile court. The position carries a salary of $5,000 a year and the examination is to be as to the mental and physical condition of delinquent and dependent children who appear in the juvenile court.

Free Aid to Working Women.—The following women physicians of Chicago have offered to give their services free to working women and also to help in the municipal dance halls. Drs. Sadie B. Adair and Lindsay Wynekoop have been assigned to the south side dance halls; Drs. Blanche Bergman and Agnes Mikkelsen to those on the west side, and Drs. Effie L. Lobdell and Clara P. Seippel to the north side dance halls.

Health Exhibit Opened.—The Chicago Health Department, Board of Education, Municipal Tuberculosis Sanatorium, United States Bureau of Food Inspection, United States Bureau of Animal Industry and Illinois State Board of Health have united their efforts with those of many private organizations of Chicago and elsewhere to produce a new type of expedition picturing health from the standpoint of the common interest. This expedition was opened to the public at the City Club, December 1, and includes all phases of municipal health problems, infant welfare, bad lighting, inadequate school inspection, etc.

LOUISIANA

Tribute to Dr. Dowling.—The New Orleans *State*, in its issue for November 15, says editorially:

"When the Southern Medical Association elected Doctor Oscar Dowling of Louisiana to its presidency, that body bestowed a merited honor. Dr. Dowling, as president of the State Board of Health, has brought to his work energy, courage, intelligence and enthusiasm. He has set a standard in Louisiana for the discharge of the duties of public office. He has won for the health department of Louisiana a reputation equalled by few and surpassed by none other of the like departments in other commonwealths. The good this has done for Louisiana, in correcting false impressions abroad, in remedying conditions on which some truthful unfavorable impressions were based, has been incalculable. Many thousands of Louisianians will live longer, live more effectively for themselves and for their communities, because of the work Dr. Dowling has done, and the interest he has stirred in cleanliness, sanitation, and decent and right living."

MARYLAND

New Diet Kitchen.—The new diet kitchen which has been presented to the Hebrew Hospital by Mr. Wm. M. Benesch, was formally turned over to the hospital on November 25. The gift was accepted on the part of the institution by Dr. Harry Adler, Baltimore, president of the hospital board. The kitchen is equipped for the preparation of special foods and is also a school for the instruction of nurses in training in the science of dietetics.

Portrait Presented to Faculty.—A life-sized oil painting of Dr. Samuel Clagett Chew, dean of Baltimore physicians, formerly president of the Medical and Chirurgical Faculty of Maryland, a member of the Board of Regents of Maryland for more than forty years, was presented to the faculty November 20, by the Baltimore City Medical Society. The ceremony took place at Osler Hall. The presentation addresses were made by Drs. Charles W. Mitchell and William S. Thayer. Dr. Randolph Winslow, president of the faculty, accepted the portrait on behalf of the faculty.

MASSACHUSETTS

Dental Infirmary Dedicated.—The Forsyth Dental Infirmary for Children, Boston, was formally dedicated November 24. The infirmary is a gift to the city of Boston from John Hamilton and Thomas Alexander Forsyth in memory of their brothers, James Bennett and George Henry Forsyth, and has an endowment of $2,000,000.

Personal.—Dr. John J. Dowling has been appointed superintendent of the Boston City Hospital, vice John C. McCollom.——Dr. H. J. Gosline has been appointed assistant physician at the Danvers State Hospital.——Dr. Charles A. Reese, West Newton, was knocked down by an automobile truck November 22 and painfully injured.

Health Hints to Public.—The annual course of free public health talks given under the auspices of the Robert Dawson Evans Memorial Department of Clinical Research and Preventive Medicine began November 17, at the Memorial Building in Boston, when Dr. Allen J. McLaughlin, the new health commissioner of the state, gave a talk on "The Importance of Public Education in the Prevention of Diseases." The talks will continue to be given each Tuesday evening until May 25, 1915.

MICHIGAN

Tuberculosis Building Opened.—The Anna T. Dodge Children's Building of the Detroit Tuberculosis Sanatorium, was formally opened to the public on Tuberculosis Day, November 29.

Diphtheria General Throughout the State.—Dr. John L. Burkart, Lansing, secretary of the State Board of Health, says that diphtheria is general throughout the state, over fifty cases having been reported from Ithaca alone. Schools have been closed at Bay City and other places.

MINNESOTA

State Cancer Committee.—Dr. William J. Mayo, Rochester, has been appointed chairman of the Minnesota State Committee of the Medical Society for the Control of Cancer. He has associate with him on this committee, Dr. James E. Moore, Minneapolis, and Dr. Warren A. Dennis, St. Paul.

Personal.—Dr. Carl J. Holman, Mankato, has been appointed a member of the State Board of Medical Examiners, succeeding Dr. John W. Andrews, Mankato, who was elected to the state senate at the November election.——Dr. Charles A. Stewart is reported to be ill at his home in Duluth.

Red Cross Christmas Seal Campaign.—The Minnesota Public Health Association, which has charge of the sale of Red Cross Christmas seals in the state, announces a series of prizes to districts and district managers varying from the services of a baby welfare nurse to pennants or banners in consideration of the sale of the Christmas seals.

Bass Lake Preventorium.—The League of Protestant Women of Minneapolis have purchased Oakwood Inn, Bass Lake, for $15,000, and will convert the inn into a sanatorium for the prevention of tuberculosis in children. The institution owns eleven acres of land and is located on the lake shore. Dr. Longstreet Taylor will be in charge of the sanatorium.

MISSISSIPPI

Pellagra Excluded from Natchez Hospital.—The board of trustees of Natchez Charity Hospital, November 11, decided, in view of a reduced appropriation, to exclude all pellagra cases. The Vicksburg Emergency Hospital had previously taken similar action.

State Hospital Overcrowded.—The Mississippi Insane Hospital, Jackson, showed an average of 1,527 for the month of October. The appropriation made by the legislature was based on an average of 1,450 at a per capita of $140 per annum. Thus the institution is caring for 77 patients more than has been provided for by the state.

Free Pasteur Treatment.—By an arrangement perfected by the secretary of the Mississippi Board of Health and the United States Public Health Service, the State Board of Health announces that it will treat all cases of rabies free of charge, provided the persons suffering from the disease are unable to take treatment at the Pasteur institutions located at New Orleans or Memphis. The only stipulation is that the treatment be administered by an official of the State Board of Health.

NEW YORK

County Tuberculosis Hospital.—Suffolk County has voted in favor of a tuberculosis hospital and has appropriated $50,000 for its establishment.

Mental Defectives.—In a recent address Robert W. Hebberd, secretary of the state board of charities, urged an extension of the state institutions for the care of feebleminded persons. He states that a recent investigation shows that there are nearly 9,000 mentally defective persons in the state outside of New York City who are unsuitably cared for in their homes and in almshouses. A survey of New York City is now being made. A bond issue is recommended as the best means of raising funds to make provision for these unfortunates.

New York City

Roentgenologists Incorporate.—A certificate of incorporation was granted, November 14, to the New York Roentgen Ray Association with the following directors: Drs. I. Seth Hirsch, George Sloan Dixon, Adomiran Judson Quimby, William A. LaField and Archibald P. Evans.

The Common Drinking Cup in Theaters.—An inspection of the theaters of the city has just been completed with reference to the use of the common drinking cup. Of the 429 theaters visited only 16 violations of the law were discovered and 14 of these were in Brooklyn.

Red Cross Seals on Sale.—A large committee composed of citizens of Manhattan has been organized and is conducting a campaign to dispose of 3,000,000 Red Cross Christmas Seals, the proceeds of which go to the Committee on Prevention of Tuberculosis of the Charity Organization Society. Special efforts are being made to bring the importance of this home charity to the attention of the public.

Cancer Research Report.—The report of Dr. Francis Carter Wood, director of the George Crocker Cancer Research Fund, has just been submitted to the College of Physicians and Surgeons of Columbia University. The report reviews the research work of the past year and contains a special warning to physicans against the wide use of colloidal silver salts by doctors in treating various diseases. The results of these investigations are to be published for the benefit of practitioners throughout the country. Dr. Wood states in the report that the laboratory should in time become a central bureau for information on any phase of the cancer question. With this idea in view, a large private collection of slides, amounting to some 3,000 separate specimens, has been turned over to the fund by the director. Several well-known pathologists of Europe have signified their willingness to supply the Crocker fund with a series of specimens illustrating rare forms of tumors.

PENNSYLVANIA

Sanatorium Wing for Children.—The State Health Department has decided to devote the new west wing of the Cresson State Sanatorium entirely to children. The new ward which cost about $300,000 will have small wards, each containing eighteen beds, private rooms, play rooms, etc. The new wing will be ready for occupancy early in the spring.

State's War on Typhoid Reduces Mortality Greatly.—In spite of the recent outbreak of typhoid fever at Lehigh and of the fact that there are a larger number of cases of typhoid in the hospitals of the state at present, there has been a remarkable decline, both in the death-rate and morbidity since 1906, when an active fight against the spread of the disease began in Pennsylvania.

Personal.—Dr. Fred L. Grander, Forest City, fell on an icy sidewalk November 20, fracturing his left shoulder.——Dr. Robert W. Stewart, Pittsburgh, has returned from Europe. ——Dr. Frank V. McConkey, York, has been appointed a medical inspector under the division of Industrial Hygiene of the State Department of Labor and Industry.——Dr. William F. Muhlenberg, Reading, has been elected vice-president of the Pennsylvania-German Society.——Dr. Jesse H. Hazlett, Vanderbilt, is under treatment in the Allegheny Hospital, Cumberland, as the result of a skull fracture received in an automobile accident near Cumberland, November 9.

Philadelphia

Mütter Lecture.—The Mütter Lecture on Surgical Pathology for 1914 was given in the Thompson Hall of the College of Physicians of Philadelphia, December 4, by Dr. Fred H. Albee, New York City, on "The Fundamental Principles Involved in the Use of Bone Grafts in Surgery."

Personal.—Dr. Thomas McCrae has been appointed consulting physician at Girard Hospital.——Dr. Edward K. Tullidge sailed for Europe to serve in the Austrian Field Hospital.——Dr. John B. Carnett has been appointed surgeon at the Philadelphia General Hospital to succeed Dr. Edward Martin, resigned.

Medal to Dr. R. Tait McKenzie.—A silver medal in recognition of his work in athletic sculpture has been sent by King Gustavus of Sweden to Dr. R. Tait McKenzie, physical director at the University of Pennsylvania. The medal bears on one side the likeness of the King and on the other the Royal Arms of Sweden.

Curtin Medical Scholarship.—An effort is being made by the Philadelphia Alumni Society of the Medical School of the University of Pennsylvania to complete the fund for the purpose of endowing a scholarship in the medical school of the university in the name of the first president of the society, Dr. Roland G. Curtin. Subscriptions to the fund should be sent to Dr. L. H. Adler, Jr., 1610 Arch Street, Philadelphia.

News of Medical Institutions.—The campaign fund for the hospital to be known as the Providence General Hospital, Germantown, has reached over $29,000. Fifty thousand dollars is necessary to start the building of the first wing on the 7-acre property at Wissahickon Avenue and Lincoln Drive. ——about $1,300 was contributed November 18, "Donation Day" at the Children's Hospital, which receives no money from the city or state.

CANADA

Montreal Hospitals Seek Financial Aid.—The General, Western and Notre Dame hospitals of Montreal have appealed to the board of control of that city for funds to carry on their work. It was pointed out that the hospitals would have to meet a combined deficit at the end of the present year of $84,000.

University Professor Dies.—G. R. Mines, M.A., professor of physiology at McGill University, Montreal, died in his laboratory, November 7. Professor Mines had been experimenting on himself regarding the phenomena of the heart action and respiration and it is believed, lost his life while engaging in experimentation of this nature.

Decrease of Drinking in Canada.—Canada produced in the fiscal year of 1914, 6,972,583 proof gallons of spirits as compared with 6,458,452 in the previous fiscal year. The per capita consumption of spirits was 1.061 gallons as against 1.112 in the previous year. The average consumption has, however, been going up in Canada since 1886 when it was only .711 per capita. Canadians are drinking more beer, the consumption per capita being now placed at 7.200 as compared with an average of 3.840 in the last four decades. There has been little decrease in the average consumption of wines which is now .124 as compared with the previous average of .119. The consumption of tobacco per head is now 3.711, a little less than the previous figure of 3.818.

Medical Reciprocity with Great Britain.—The action of the home authorities in refusing commissions to Ontario graduates to serve in either the British army or navy unless they are able to comply with the regulations of the General Medical Council has again precipitated the whole question of medical reciprocity between the provinces of Canada and the home land. The Dominion Medical Council has, as yet, not established any measure of medical reciprocity; the eastern provinces have Quebec, New Brunswick, Nova Scotia and Prince Edward Island. It is stated that the executive of the Ontario Medical Council has refused to call a special meeting of council looking toward immediate reciprocity with Great Britain, on old grounds which are well known.

Progress Made in the Tuberculosis Campaign.—Since March, 1913, nine additional institutions for the tuberculous have been opened in different parts of Canada—one at Ottawa; Brantford; Mount Sinai at Ste. Agathe, Quebec; Windsor; River Glade, N. B.; Halifax; The Preventorium, Toronto; Queen Mary Hospital for Tuberculous Children, Weston, Ont.; The Connaught Home for Nurses at the same place; the Preventorium at London, Ont. Extensive additions have also been made to the Provincial Sanatorium at Kentville, N. S.; the Freeport is about ready in Waterloo County, Ont.; the Provincial Sanatorium at Qu'Appelle, Sask., is being erected. Prince Edward Island and Alberta are also making moves in the same direction. Calgary has voted $30,000 for a municipal hospital for advanced cases, and Quebec City has also raised over $60,000 for the same purpose. In twelve sanatoria reporting on the cost of maintainance, the average cost of each patient per day is $1.55.

GENERAL

Health Officer Appointed.—Lieutenant Douglas W. McEnery, M. C., U. S. A., has been appointed special health officer of the city of Panama.

Error in Article by Dr. DeBuys.—In the article by Dr. L. R. DeBuys, entitled "Amebic Dysentery in Children," printed in THE JOURNAL for November 21, p. 1806, in table 2, column headed "Ameba," the dates February 12 to 16, there should be a plus sign indicating that ameba were found on these dates.

Duluth and Superior Physicians Meet.—At the annual meeting, November 18, of the Interurban Academy of Medicine, whose membership includes physicians of Duluth, Minn., and Superior, Wis., Dr. Henry A. Russell, Superior, was elected vice-president; Dr. Archibald L. McDonald, Duluth, secretary-treasurer.

Experimental Biologists to Meet.—The federated meeting of the Southern Experimental Biologists comprised of The American Physiological Society, American Society of Biological Chemists, American Society of Pharmacal and Experimental Therapeutics and the American Society of Experimental Pathology will hold its next meeting at the Washington University Medical School, St. Louis, December 28-30.

Virginia University Alumni Organized.—At the meeting of the Southern Medical Association, the University of Virginia Medical Alumni organized with the object of advancing the interests of the University of Virginia Medical School. The following officers were elected: president, Dr. Hugh H. Young, Baltimore; vice-president, Dr. John Staige Davis, University, Va.; secretary, Dr. Seale Harris, Mobile, Ala., and treasurer, Dr. Thomas V. Williamson, Norfolk, Va.

Meeting of Tri-State Physicians.—At the thirty-first annual meeting of the Tri-State Medical Association of Tennessee,

Arkansas and Mississippi, held in Memphis, November 17 to 19, the following officers were elected: president, Dr. William P. Hicks, Earle, Ark.; vice-presidents, Drs. Jacob L. Hare, Wynne, Ark.; B. Vernon Dickson, Covington, Tenn., and Ephraim R. McLean, Cleveland, Miss.; secretary, Dr. James L. Andrews, Memphis (reelected); treasurer, Dr. James A. Vaughan, Memphis (reelected).

Federal Foot-and-Mouth Quarantine Partially Lifted.—An order, to become effective November 30, has been issued, releasing from some restrictions of live stock quarantine certain counties in Wisconsin, Illinois and Iowa. Cattle from these counties may be shipped in interstate commerce for immediate slaughter and for feeding purposes, but may not be shipped out for feeding elsewhere. This release order is the first issued since the quarantine was ordered, and will be followed as soon as possible by similar orders lifting the quarantine in other localities. Confidence is felt that the epidemic is now under control and will soon be eradicated.

Medical Missionaries Meet.—In spite of the confusion in mission fields as a result of the war in Europe, the Sixth Inter-Denominational Medical Missionary Conference held in Battle Creek, Mich., November 17-20, was attended by 200 workers from home and foreign fields. The probable effect of the war on mission work was very generally discussed, the consensus of opinion being that a temporary withholding of mission gifts would be experienced, but that the final effect would be a broader brotherhood and a most salutary condition in mission work in general. The conference will meet again in 1915 in Battle Creek.

Bequests and Donations.—The following bequests and donations have recently been announced:

Howard Hospital, Philadelphia, $5,000 to maintain a free bed to be known as the Annie E. Ulmer bed; West Philadelphia Hospital for Women, a bequest of $1,000 by the will of the late Annie Mathews.

Bieur Cholim Hospital, Jerusalem, and Anniston Hospital, Anniston, Ala., each one-fourth and the National Jewish Hospital for Consumptives, Denver, one-half of the estate of L. H. Caplan, Anniston.

Charity Hospital, New Orleans, La., $1,250 by the will of Mrs. Ida P. Richardson, New Orleans.

Church of St. Luke and Epiphany, Philadelphia, a donation of $1,000 to start a fresh air fund; University of Pennsylvania, Philadelphia, about $1,000,000, to be divided among the library, hospital, for the maintenance of free beds, for the system of hydropathic treatment, the department of cutaneous medicine in the Medical School for the advancement of its work and the department of archeology and paleontology, by the will of Dr. Louis A. Duhring.

Maimonides Hospital, Chicago, an appropriation of $2,000 by the Federated Orthodox Charities of Chicago.

Harvard Medical School, $25,000, the income to be used for cancer investigation work; Massachusetts General Hospital, $25,000 for the endowment of a free bed by the will of Mrs. Endicott, Boston.

FOREIGN

Professor Erb's Fiftieth Professional Anniversary.—In October the well-known Heidelberg neurologist, Prof. Wilhelm Erb, completed the fiftieth year of his professional career. His son was one of the first to fall on the firing line, as already mentioned in these columns.

Death of Emmerich.—The death is reported of R. Emmerich, professor of hygiene at the University of Munich, author of numerous works on hygiene and epidemics, aged 62. His views on the importance of the nitrates in the soil as a factor in cholera were reviewed in THE JOURNAL, 1904, xliii, 640.

Decorations for Members of the Profession.—The grand cross of the Order of Alfonso XII has recently been presented to the professor of pharmacy at the University of Madrid, J. R. Carracido, who is also a senator, and the Isabella cross to S. Recasens, professor of gynecology at the same seat of learning. The decorations were conferred, the announcement reads, for distinguished services to the *cultura nacional*.

Death of Leading Italian Hygienist.—Our latest exchanges bring obituaries of Angelo Celli, aged 57, to whom Italy owes its present partial emancipation from malaria. He has long been professor of hygiene at the University of Rome, chief of the national board of health and senator of the realm, and to his initiative is due the government monopoly of quinin and its sale practically at cost in every post-office. He was also influential in legislation on the working hours for women and children, in the reclaiming of the marshes around Rome, and other public welfare works. In collaboration with Marchiafava, he published the first description of the meningococcus, and of certain phases of the malaria parasite, and was a frequent contributor to the literature on various topics of internal medicine. He was one of the leading scientists of the world invited to speak at the International Congress of Arts and Science held at the World's Fair in St. Louis in 1904.

WAR NOTES

American Hospital Opens in Petrograd.—An American hospital with a capacity of forty beds, the gift of the American colony in the city, was opened at Petrograd November 28.

More Red Cross Surgeons for Russia.—The American National Red Cross are sending two additional surgeons to reenforce the American Red Cross Hospital units already sent.

The Red Cross in Servia.—Dr. Edward W. Ryan, director of a hospital unit sent to Servia, states that surgeons are very scarce in that country and with about 50,000 wounded, the work is exceedingly heavy. The nurses are working from 8 o'clock in the morning until 7:30 at night.

Precautions Against Disease.—Folkestone is now practically the only port in England open to commercial and passenger business from the Continent, and the health officers at that port are taking unusual precautions to prevent the admission of disease into England from the war zone.

Work of the Japanese Red Cross.—The Japanese Red Cross has sent detachments of surgeons and nurses to Russia, France and England, and quantities of hospital supplies for Belgium and Servia. They have also equipped two hospital ships which are caring for the sick and wounded of Germany and Japan.

Needs of American Hospital.—Dr. James A. Blake, in charge of the American Ambulance Hospital, Paris, has cabled to Mrs. George Wharton Pepper, Philadelphia, that the following supplies are needed for the work of the hospital: surgical gauze, ice bags, hot-water bags, rubber gloves, bed pans, rubber sheeting, syringes, rubber tubing, underclothes, pajamas, abdominal belts, socks, mufflers, scarfs, etc.

Red Cross Units for Servia.—Two Servian Red Cross units, Nos. 2 and 3, sailed for Patras, Greece, on the *Finland*, November 21. The physicians in unit No. 2 are Dr. Ethan Flagg Butler, Rochester, Minn., director; Dr. S. H. Rodger, Knoxville, Tenn., and Dr. James F. Donnelly, New York City. The medical director of the Red Cross unit No. 3 is Dr. Ernest P. Magruder, Washington, D. C., who is assisted by Drs. Clapham P. King, Annapolis, Md., and Morton P. Lane, New Orleans.——Dr. Dean F. Winn, Atlanta, Ga., sailed on the same steamer to join the Russian Red Cross unit.

Proposed Exchange of Medical Prisoners.—The *Münchener med. Wochenschrift*, October 27, states that the organized physicians of Germany (Verband der Aerzte Deutschlands) have petitioned the Prussian state department and war department to request the ambassador from the United States to propose to the government of Great Britain that the physicians who have been taken prisoners by the contending armies should be allowed to return home. They ask that this should be done whether the medical prisoners are or are not of the age subject to military conscription. Our exchange comments that time alone will tell whether this attempt will be successful or not.

Medical Supplies to German Red Cross.—On board the steamer *Potsdam* which sailed from New York City, November 10, the following supplies were sent to the German Red Cross: ten cases of hospital clothing, 2,000 pounds of bandages, 100 bales of absorbent cotton and 6,000 yards of gauze; and for the American Hospital in Munich 1,000 pounds of bandages, 50 bales of absorbent cotton and 4,000 yards of gauze and ten cases of hospital clothing.——The *Rochambeau*, which sailed from New York, November 14, carried the following hospital supplies for the French Red Cross: 20,000 pounds of absorbent cotton, 20,000 bandages, 10,000 yards of gauze, 10,000 yards of starched gauze for splints, 10 gallons of iodin, 2 barrels of alcohol, 500 blankets and 20 boxes of hospital clothing.

Compulsory Insurance in Germany and Austria.—The war is playing havoc with the organized state insurance of workingmen against sickness and accident. As the insured breadwinners have been drawn into the army, they have stopped paying their regular monthly premiums, and the *Kassenkranken* find that their business is practically all outgo with little coming in. Each has been collecting for years a reserve fund, but if this should become exhausted, the insurance companies would have to suspend operations. They have cautioned the physicians in their service to be extremely economical with dressings, drugs, etc. At some points they have stopped sending the tuberculous insured for the regulation course of sanatorium treat-

ment, and the medical profession is alarmed at the danger of the spread of tuberculosis in the homes when nothing comparatively is being done for bacilli-scattering tuberculous working people.

American Red Cross Units Located.—Unit G of the American Red Cross has been located at Kosel in Southeast Germany, near the borders of Russia and Austria. It is attached to a military hospital of about 800 beds and has about 700 patients in its care. Dr. Bial F. Bradbury, Norway, Maine, is in charge of this unit.——Unit I is in charge of Dr. Charles H. Sanders, Washington, D. C., and is located in Gleitwitz, about 30 miles from Kosel, in a theater that has been converted into a hospital with accommodations for about seventy patients.——The units sent to Russia are said to be stationed at Kiev, back of the line of the Russian army in Austria, Galicia.——Unit D has left the Haslar Royal Naval Hospital, Gosport, and has joined Unit F at the American Woman's War Hospital, Paington.——Unit K, in charge of Dr. Cary Snoddy, is located at Vienna, Austria.——The unit located near Pau, France, of which Dr. Reynold F. Kirby-Smith, Sewanee, Tenn., is medical director, writes that medical supplies are urgently needed there and that the unit is located in the Palais d' Hiver, which has been converted into a hospital.——Unit E, located at Budapest, of which Dr. Charles E. McDonald, Salem, N. J., is medical director, has been given a modern building with 200 beds and properly equipped for a hospital.

German Medical Officers at the Front.—The *Berliner klinische Wochenschrift* publishes a reply from Körte to some criticisms of the work of the medical officers in the field, in which he says that gangrene is liable to develop in a serious wound of the leg even under the most scientifically applied dressings. To say that the dressing caused the gangrene is a far-fetched claim. In the district in his charge, he says, he has been amazed at what the medical officers are able to accomplish. In every field hospital and medical corps he has found at least one and generally several trained surgeons. "The task of applying the dressings and getting the men to bed (lying on straw), with scant assistance, is a hard one even when there are only a few hundred wounded. But when the wounded number thousands, the task is beyond human powers to accomplish it all. Whatever is humanly possible is done. It is easy for those at home to criticize, but it would be hard to do any better. Our work is not light, and it takes nerves of iron. In regard to the Belgian physicians, I have heard only praise, and I have seen much of their work. Our German wounded do not require aid of Belgian surgeons now, as they are all cared for in German field hospitals; there are five now in and around Brussels. The leaders among the Belgian surgeons, Depage, for instance, are faultless." [It will be remembered that Professor Depage here referred to presided at the Fourth Congress of the International Society of Surgery held at New York last spring. It is especially appropriate, considering what has followed since last April, to quote the first few lines of his opening address: "The first three meetings of the International Surgical Society took place in Belgium. We gave the preference to a neutral country so as to clearly define the scientific and at the same time the fraternal character of our association. It is not necessary for me to tell you that it is the privilege of our little Belgium to offer a meeting place to the learned men of all nationalities, covered by Europe herself with the shield of peace and liberty."]

LONDON LETTER

LONDON, Nov. 18, 1914.

The War

There are being trained in this country 1,250,000 men for the new army, and recruits continue to be enlisted in large numbers every day. For a few days a lull occurred in the large number joining, but the outcry of the authorities that more men were still wanted at once restored matters. A movement is also on foot for the formation of defense forces from civilians who cannot join the army, but desire to defend their homes in the improbable event of an invasion. The government has been asked to say what should be done so that those willing to take up arms may ensure the rights of combatants for themselves. They have replied that the matter is under consideration. No doubt they are for the time too busy with the more pressing problem of the new army to attend to a new organization. Every means is being taken to safeguard the health of the recruits, mostly very young men. The public is appealed to not to show their friendliness for the soldiers in the usual manner of giving them intoxicating drinks, and the saloons are compelled to close at 10 p. m. instead of the usual hour, 12. Arrangements are being made for lectures to the recruits on the dangers of venereal disease.

The Health of the Troops in the Field

All the reports seem to show that the health of the troops in the field is excellent and that disease has not yet become a factor in invalidity to any extent. Typhoid fever has been mentioned in German reports and cholera in Austrian, but we appear to have had no experience with either disease. The illnesses most frequently mentioned in our reports are pneumonia and rheumatism—natural results of the prolonged exposure to cold and wet in the trenches. Cases of dysentery have occurred, but not in any numbers. Possibly no army in the field has ever before had its wants so well supplied as ours. Our lines of communication, including the sea, have never been even threatened, so that ample supplies of all kinds have been insured. At the front they are conveyed to the troops by a well-organized system of motor transport. The soldiers are so well fed that they have often been able to give from their abundance to the destitute French and Belgians flying from the invaders. With the approach of winter our women are preparing large quantities of woolen garments to send to the soldiers. The queen, who has organized this movement, has made an appeal for 300,000 body belts and pairs of socks, which has met a ready response. The Indian soldiers have not been forgotten, and a special fund is being organized for their benefit.

Consultants to the Royal Navy

The appointment of consulting physicians and surgeons to the army at the front has already been announced. The following well-known consultants have been appointed to the navy: Sir W. Watson Cheyne, Mr. G. R. Turner, Mr. Arthur Edmunds and Mr. C. H. M. Hughes (Naval Hospital, Chatham); M. G. Lenthal Cheatle, Dr. H. D. Rolleston and Mr. C. W. Morris (Naval Hospital, Haslar); Mr. Raymond Johnson (Naval Hospital, Plymouth); Sir Alfred Fripp and Dr. D. A. Shields (H. M. Hospital Ship *Sheelah*), and Sir William Macewen.

The British Red Cross

This society has now organized in Great Britain 359 hospitals containing 11,730 beds, as well as despatched surgeons, nurses and material of all kinds for the sick and wounded to France. It has also acquired a steam yacht of 380 tons for a hospital ship which will have twenty-one beds for private soldiers and three separate cabins for officers.

Appeal from the French Red Cross

An appeal for motor cars and funds for their upkeep has been made on behalf of the French Red Cross and has received the influential support of the queen and others. It is pointed out that the front held by the French troops is at least six times as long as that held by our own. With less population than ours the French have nearly ten times more soldiers in the field. Since nearly the whole of the active male population of France is under military orders, there is hardly any one left to whom the French authorities can appeal for more voluntary assistance, now that the supply of French motor cars has been used up. Belgium and France have supplied the battle ground for a war which has not yet inflicted any of the horrors of invasion on England, and the districts devastated by Germany are precisely those which, in coal fields and in beet sugar, are among the wealthiest in France, so that the damage done already is equivalent to the war indemnity paid by France in 1871. When cars are lent the owners can themselves drive and bring their own mechanic, can themselves drive and be provided with a mechanic, or can send their cars alone. The French Red Cross will arrange the cars in units of six, so that a group of half a dozen friends can work together if they wish. A central depot in London is being arranged for the committee, where all cars offered will be inspected.

The Wounded at Home

Though the wounded are distributed in the hospitals throughout the length and breadth of the land, and hospitals have been improvised everywhere for their reception, so great is the number now that difficulty is beginning to be felt in the accommodation of ordinary hospital cases. A Dublin surgeon, Sir Thomas Myles, points out that the recent arrivals of wounded soldiers from France have taxed the general hospitals to their full capacity. He suggests the immediate erection of a temporary hospital capable of holding a thousand beds. Last week 700 wounded were landed in Dublin. The cases are more serious than those received earlier. Most of the patients are suffering from septic

wounds, more or less serious, but comparatively few show any signs of general sepsis. The infection generally appears to be of *Staphylococcus aureus*, though a certain number of wounds have *Bacillus pyocyaneus* present.

Effect of the War on the Medical Schools

As stated previously, the war has had the effect of greatly diminishing the number of students in the medical schools, because some have gone to the front as dressers and others have joined the fighting ranks. Against this, there has been a gain in another direction. Medical students among the Belgian refugees, and Russian and Japanese students who were studying in the German schools, but had to leave in consequence of the war, have been admitted. This novel experience has caused a difficulty in that one group of students has to be addressed in French, while Russians can be spoken to only in the German language. Cambridge University is giving hospitality to the expatriated. Unofficial courses are being given there to refugee students by eleven Belgian professors from Louvain. Facilities are also given for students who understand English for attendance at the ordinary courses. Assistance is being given to those unable to meet the moderate charges of four or five dollars a week for board and lodging, but to be eligible for such assistance and for free courses the students must submit themselves to a medical examination before the Belgian authorities, now in this country, and obtain a certificate of unfitness for military service. (The medical schools of Belgium were described p. 1751.)

The Treatment of German Prisoners

An official from the American embassy, by request of the German government, has visited the German prisoners in this country and made a report. He gives the daily rations already stated in THE JOURNAL, and adds that an ample supply of utensils for cooking is provided. The prisoners manage their own cooking. Each man has delivered to him a plate, knife, fork, spoon and mug. Each camp has a canteen at which fruit marmalade, sweets, biscuits, preserved meats, tobacco, etc., can be bought at moderate prices. The scale of prices is settled by the commandant. The regulation directs that each man is to receive two warm army blankets. The regulation is being carried out, but there has been some delay in the issue of the second blanket in certain cases. The issue of the second blanket to every prisoner will be completed as soon as possible, and before the coming of cold weather. In the roofed-in camps most occupants have wooden bedsteads, made by themselves from wood handed over to them for the purpose. The official heard the complaint made that not every prisoner had yet got a bedstead, as the wood provided had not quite sufficed to go round. He was told that the wood had been ordered and that the deficiency would soon be made up. Along with the wooden bedsteads, straw mattresses have been provided. In the open-air camps each tent has twelve inmates who sleep on the wooden floor of the tents on sack beds. Most of the prisoners made no complaint about the sleeping arrangements. Some few, who came from the better classes, missed their own soft beds to which they were accustomed. But they are allowed to buy what provision they please with their own money, and in most cases plenty of money is forthcoming. An outfit of good cut from warm practical cloth material, with underwear, shirts, socks, shoes, all of excellent make, pocket handkerchiefs, brush and comb has been given to all men needing them. Sufficient facilities are given for washing all clothing, and a copious supply of shower baths is forthcoming. In the roofed-in camps warm water baths are provided. Soap is supplied in unlimited quantity for cleaning purposes.

Death of Captain Angus Macnab

The death of Captain Angus Macnab, the ophthalmic surgeon to King Edward VII Hospital at Windsor, whose studies were pursued at Edinburgh, Moorfields, Freiburg and Vienna, the translator of Axenfeld's Bacteriology of the Eye and of Lolunaun's Disturbances of the Visual Functions, has given rise to deep regret, especially among the London Scottish Regiment, whose medical officer he was. Captain Macnab was with his regiment in the trenches rendering aid to the wounded, when, in a charge, he was fatally wounded.

Army Medical Casualties in the War

Since my last report the casualties among medical officers of the army have been: killed, 3; died of wounds, 3; wounded, 11; missing, 5; prisoners of war, 6. Captain H. S. Ranken, who died of his wounds on September 25, was awarded the most coveted distinction, the Victoria Cross, for valor, "for continuing to attend to wounded after his thigh and leg had been shattered" on September 20.

PARIS LETTER

PARIS, Nov. 12, 1914.

Hughes' Electromagnetic Balance and Its Application to Military Surgery

The celebrated electrician, Hughes, once devised a little electromagnetic apparatus by which it is possible to discover the location of a metallic mass such as a piece of money or a bullet. This old invention seems to have been entirely forgotten until M. G. Lippmann, professor at the Faculté des sciences de Paris recently brought it to light at the Académie des sciences in the hope that it might be profitably employed in military surgery. It is simple, light, portable, inexpensive and easy to construct. It might be used in the numerous cases in which roentgenography is not available. It is composed of an electric battery, an interrupter and two little induction coils (Ruhmkorff without soft iron) of which the primaries are in the battery circuit and the secondaries are in series with a telephone, the receiver of which is held to the ear of the observer. The apparatus is so constructed that the opposing electromotor forces which act on the telephone are exactly equal, and, while they are in equilibrium, the telephone remains silent. If one of the coils is brought near a metallic mass, a sound is heard over the telephone. This is because induced currents arise in the metallic mass and react on the nearest coil but not on the other thus disturbing the electric balance. The sound of the telephone thus reveals the approach of the metallic mass. If the latter is magnetic (fragment of shell or German balls) the effect will be still more marked, since the magnetic mass reinforces the induced current in the nearest coil. The electromagnetic balance is therefore more sensitive to the approach of a German ball than of a French ball.

The Treatment of Tetanus by Large Doses of Chloral

November 4, Dr. Dammler, chief physician of the army, read a paper on this subject before the Académie de médecine. In 1889 he had occasion to treat a case of tetanus with chloral in doses of from 20 to 25 gm. per day. This procedure was then recommended by Professor Verneuil. At present Dammler administers a dose of 6 gm. of chloral every six hours until the patient is in such a state of torpor that all hyperexcitability from the tetanus is abolished. Professor Capitan recently employed Dammler's method with complete success in a particularly serious case of tetanus.

Services Rendered by Sanitary Dogs in the Present War

In previous letters I mentioned the attempts which have been made to train sanitary dogs and to supply our army with a sufficient number of dogs especially trained to search for the wounded (THE JOURNAL, Aug. 26, 1911, p. 751; Jan. 25, 1913, p. 299). From the beginning of the mobilization, the Institut de psychologie zoologique requested of the ambulance attendants to whom the sanitary dogs were entrusted brief reports on the conduct of their aids under fire. M. P. Hachet-Souplet, director of the institute, has just published some of the numerous letters which he has received on the subject. They are, in the main, very encouraging. No doubt it would be possible to criticize some details of the instructions given to the dog. Thus, the plan of having the dog bring back the wounded man's cap or handkerchief seems bad. Still the sanitary dogs are rendering important services and it is regrettable that there are not several for each ambulance.

An Association française pour le dressage du chien de guerre has just been formed. Already a large number of dogs have been given to it and sporting societies have opened their immense grounds for its use.

Belgian Physicians on French Ships

The minister of the interior has just authorized the employment of Belgian physicians on French merchant vessels during the war.

The Resumption of Courses in the Paris Medical School

The Faculté de médecine de Paris has just resumed its courses but its program is markedly abbreviated. All the courses for first- and second-year students are to be given under ordinary conditions. All the other courses are postponed until the summer semester. Courses in internal and external pathology, however, are to be given during the winter semester. The clinics remain open to the students.

Personal

November 10, the Académie de médecine elected as national associate Dr. Langlet, professor and director of the Ecole de médecine de Reims and mayor of that city.

Women-Doctors' Hospital at the Front

The hospital organized and controlled entirely by English women doctors at Paris has vindicated its efficiency. It has been placed officially under the War Office, and is permitted to draw rations and fuel from the army stores. One of the women orderlies has been appointed quartermaster. A receiving hospital has been established in Boulogne, whither half of the staff has gone, and is now working under military control. Although the hospital is only a freight shed at the railway station, an excellent operating theater has been fitted up, and the fair surgeons have been earning great commendation from the military medical inspectors.

BERLIN LETTER

Berlin, Oct. 28, 1914.

The War

Considering the great distance at which the present firearms, not only of the artillery but even of the infantry are fired, it is inevitable that dressing stations should be placed too near to the firing line and that they will be reached by missiles. Moreover in view of the great distances at which the opposing troops so often stand, it is inevitable that the Red Cross will not always be recognized. In addition, there are the injuries by bombs from the airships. All these circumstances have as a result that we already have lost a disproportionately large number of surgeons. While, in Franco-Prussian War, 1870-71, of 4,062 physicians on the field of battle on the German side, only nine fell and two later succumbed to their wounds, nearly 100 of about 9,000 surgeons, at present in the field, have fallen and thirty-seven have been wounded besides thirteen missing and three taken prisoners. Presumably among the missing are some who have fallen and hitherto have not been found but the greater number must have been taken prisoners.

The murderous battles have naturally had a large number of deaths and wounds among the soldiers. With regard to the extent of the losses, definite figures, naturally, cannot be given. As the reports from many parts of the army are received under very difficult conditions with great delay, the hundred lists of losses so far published give already a very sad report. Fortunately, so far the experience which has been procured in late wars with modern weapons, has been repeated with our wounded as, according to our observations, the wounds heal with surprising quickness and with proportionately small functional disturbance. Lamentable also are the large numbers of tetanus cases in our army. Relatively little disease has been reported and especially it is to be noted, that epidemics have not been hitherto observed. To be sure, in the east and in the west there have been a few hundred cases of typhoid and dysentery but these are quite sporadic and not in the nature of an epidemic, so that we may hope that this morbidity figure will be limited.

The German Red Cross

An editorial in the issue for October 29 of the *Deutsche medizinische Wochenschrift* compares the donations to the German Red Cross during the present war with those received during the Franco-Prussian War in 1870-71. At that time France was the only foe, and all the other nations contributed lavishly to the German Red Cross, a total, in round figures, of $1,875,000 cash and $3,875,000 in goods. Austria contributed $25,000; Belgium, $28,250; Denmark, $7,000; Greece, $5,750; Germans in France, $7,250; England, $140,000; Italy, $17,500; the Netherlands, $10,250; Portugal, $5,250; Russia, $100,000; Sweden and Norway, $6,750; Switzerland, $27,750; Spain, $2,750; Turkey and Roumania, $9,000; United States, $833,333 (3½ million marks); Central America, $47,500; South America, $187,500; Asiatic Turkey, $1,750; India, $50,000; China, $12,500; Japan, $17,500, and the Philippines, $3,500. Egypt donated $10,000; southern and western Africa, $13,750, and Australia, $30,500. The donations in hospital supplies, products of the various countries and jewels and art wares donated, besides the above cash, are placed at an estimated value of $3,875,000 (15½ million marks). The German Red Cross raffled off jewelry, etc., donated and thus added to the cash donations. The editorial compares the conditions in 1870-71, when all the other state were neutral, with conditions now "with half or three-quarters of the world as our foe and the rest keeping a neutral attitude, at the best wishing us well, but mostly a laboriously maintained neutrality (höchstens wohlwollend, meistens mühsam erzwungenen Neutralität uns gegenüber)." Consequently, it continues, the German Red Cross must rely on its own land almost exclusively for contributions in this campaign. To date, in addition to the American Red Cross expeditions, only Greece and Luxemburg have sent or signified their intention to send contributions or expeditions. The American contingent consisted of twelve physicians, fifty-six nurses and seven carloads of supplies, and half of these were destined for the scene of the war in Austria. In Germany, to date, August 1 to October 29, $1,250,000 have been contributed to the Red Cross.

The editorial comments further that donations in Germany are being distributed more now than formerly, other funds receiving contributions as well as the Red Cross, such as the fund for the care of widows and orphans and local organized relief work, and private benefactions. "This decentralization," it adds, "has both a good and a bad side. The essential point is only that our brave soldiers—and their families—shall be protected against lack of care and clothing. That they have had to suffer much in this respect which might have been avoided by the organization—notwithstanding all the military difficulties and exigencies—seems to be beyond question. Even the best efforts of the Red Cross were unable to provide better facilities for conveying the wounded at times. Of late, however, conditions in this respect have been materially improved."

Decoration with Pension Attached for Bavarian Medical Officers

The war department of Bavaria has announced the foundation of a new order, the Order of the Medical Corps (*Militär-Sanitätsorden*), which will take the place of the decoration founded in 1812, the *Militärsanitäts-Ehrenzeichen*. The new order will be conferred for distinguished services during war time by Bavarian physicians or physicians from outside of Bavaria who render special services to the members of the Bavarian army. The decoration is of two classes, and the one of the first class is contingent on having already received the other. The order carries with it a life annuity of $75 or $150 (300 or 600 marks).

Marriages

A. Marion Wassam, M.D., Galveston, Tex., to Mrs. Mary Hambly of Washington, D. C., at Beaumont, Tex., November 5.

Hiram Watkins Kostmayer, M.D., to Miss Carrol Houston Reichel, both of New Orleans, at Chicago, August 31.

Robert Bruce Wallace, M.D., Lecompte, La., to Miss Emma Dorothy James of New Orleans, November 9.

William P. Lee, M.D., Northfield, Minn., to Miss Alice Katherine Wentworth of Winthrop, Me., November 7.

Leonard Waterman, M.D., Norman, Neb., to Miss Elizabeth Luelle James of Calumet, Mich., September 16.

Emil J. Goldring, M.D., Philadelphia, to Miss Della Meitner of Roxborough, Philadelphia, November 3.

Walter Franklin Bleifuss, M.D., Elgin, Minn., to Miss Lydia N. Lubahn of Racine, Minn., recently.

Edward A. Marrs, M.D., Moline, Kan., to Miss Blossom N. Thompson of Howard, Kan., September 27.

Lucious W. Brock, M.D., to Miss Dan Tate, both of Mount Herman, La., at Amite, La., November 10.

William R. Shaefer, M.D., Columbia, Mo., to Miss Alice Dixon of Kansas City, Mo., November 10.

Horace F. Pierce, M.D., San Francisco, to Miss Christine Buist of Moorestown, N. J., November 11.

William H. Harris, M.D., to Miss Marie Mercedes Friedrichs, both of New Orleans, October 26.

P. A. Surg. Willard J. Riddick, U. S. N., to Miss Adrienne Ziegler of New Orleans, October 28.

Percy G. Drake, M.D., Manila, P. I., to Miss Reta Helen Taylor of Baltimore, October 22.

Paul A. Ramsel, M.D., Shiner, Tex., to Mrs. Ida Kunneth of Rockdale, Tex., November 10.

Jesse Wright Downey, Jr., M.D., to Miss May Lee Willis, both of Baltimore, November 7.

Charles Jacob Barker, M.D., to Miss Aline Coulon, both of Thibodaux, La., October 14.

D. G. Mahood, M.D., Orchard, Neb., to Miss Nora Morley of Onawa, Iowa, October 28.

Porter D. Blackburn, M.D., Houston, Tex., to Miss Alice Dodd of St. Louis, November 10.

Lovell Langstroth, M.D., to Miss Dora Winn, both of San Francisco, October 23.

Deaths

Theodore Willis Fisher, M.D. Harvard Medical School, Boston, 1861; surgeon of the Forty-Fourth Massachusetts Volunteer Infantry during the Civil War; from 1884 to 1888 clinical instructor in mental diseases, and from 1888 to 1893 lecturer on mental diseases in his Alma Mater; for many years in charge of the Insane Hospital, South Boston; died at his home in Belmont, Mass., October 10, aged 77.

George Edward Gavin, M.D. Louisville (Ky.) Medical College, 1896; a Fellow of the American Medical Association; and a well-known surgeon of Mobile, Ala.; died in that city, November 14, after a long illness from malignant disease of the bladder and liver, aged 43. At a meeting of the Mobile County Medical Society, November 14, it was decided that the members attend in a body the funeral of Dr. Gavin.

Brigadier General Peter J. A. Cleary, U. S. A. (retired), L.R.C.S. Eng., 1860; a veteran of the Civil War in which he served as Assistant Surgeon and Surgeon of U. S. Volunteers; a member of the Medical Corps of the Army from 1867 until his retirement in 1903; died at his home in Chattanooga, Tenn., November 5, from heart disease, aged 74.

Charles Irving Stotelmeyer, M.D. University of Maryland, Baltimore, 1892; of Hagerstown, Ind.; a member of the Indiana State Medical Association; trustee of Jefferson township; died in the Reid Memorial Hospital, Richmond, Ind., November 12, after a surgical operation, aged 55.

William Henry Robertson, M.D. University of Alabama, Mobile, 1887; a Fellow of the American Medical Association and one of the best known practitioners of southeastern Alabama; died at his home in Clayton, Ala., November 21, from valvular heart disease, aged 53.

Aaron G. Humphrey, M.D. New York Hygieo-Therapeutic College of New York, New York City, 1858; for more than half a century a practitioner of Galesburg; was for a few months a resident of Kansas City, Mo.; died at his home in that city, November 17, aged 82.

John S. French, M.D. Medical College of Indiana, Indianapolis, 1883; a veteran of the Civil War in which he served as Assistant Surgeon of the One Hundred and Twentieth Indiana Volunteer Infantry; died at his home in Pittsboro, Ind., September 19, aged 85.

Frank N. Yeager, M.D. University of Pennsylvania, Philadelphia, 1888; of Hamilton, Pa.; a Fellow of the American Medical Association; died in St. Mary's Hospital, Rochester, Minn., November 14, from peritonitis after an operation for malignant disease, aged 57.

George Washington Boyd, M.D. College of Physicians and Surgeons, Baltimore, 1895; a Fellow of the American Medical Association, and proprietor of several drug-stores in Washington; died at his home in that city, November 21, from nephritis, aged 55.

Robert M. Sadler, M.D. Louisville (Ky.) Medical College, 1877; died at his home in Okolona, Miss., November 10, from the effects of a gunshot wound of the head, self-inflicted it is believed, with suicidal intent, while despondent on account of ill health.

John Henry Grimes, M.D. University of Maryland, Baltimore, 1868; a Confederate veteran; vaccine physician of Baltimore in 1873; died at the Sheppard and Enoch Pratt Hospital, Baltimore, November 7, from arteriosclerosis, aged 72.

Charles B. Turner, M.D. University of Louisville, Ky., 1881; local surgeon of the Southern Railway at Bluemont, Va., and formerly a member of the Loudoun County Board of Health; died at his home in Bluemont, November 13, aged 56.

Charles H. Mordoff, M.D. Chicago Homeopathic Medical College, 1881; Hahnemann Medical College, Chicago, 1905; a member of the Illinois State Medical Society; died at his home in Genoa, Ill., November 16, from cerebral hemorrhage, aged 58.

Emil V. Helfferich, M.D. Medical College of Ohio, Cincinnati, 1883; of Cincinnati; died at the German Deaconess Hospital in that city, from injuries received in a jump from a window in that institution while temporarily deranged, aged 53.

Andrew Cursena Gregg, M.D. Starling Medical College, Columbus, Ohio, 1901; formerly of St. Mary's and Brookville, Pa., but more recently a resident of Chicago; died in the Englewood Hospital, November 2, from uremia, aged 45.

Joseph Morrison Tydings, M.D. Kentucky School of Medicine, Louisville, 1861; a Confederate veteran; well known as an author and philanthropist of Louisville; died at the home of his daughter in that city, November 12, aged 78.

John C. Smith, M.D. Southern Medical College, Atlanta, Ga., 1884; a member of the Medical Association of Georgia; for thirty years a resident of Carroll County, Ga.; died at his home in Mansfield, Ga., November 10, aged 64.

Ella S. Webb, M.D. Woman's Medical College of Pennsylvania, Philadelphia, 1885; managing editor of one of the publications of the Webb Publishing Company; died at her home in St. Paul, November 15, from heart disease.

Warren Vernon Grimes, M.D. Missouri Medical College, St. Louis, 1877; president of the board of health of Pacific Grove, Cal.; died at his home in that place, November 4, from cerebral hemorrhage, aged 57.

Frank Vincent Kimbrough, M.D. Vanderbilt University, Nashville, Tenn., 1893; of Maxon Mills, Ky.; local surgeon for the Illinois Central System at that place; died in Guthrie, Ky., November 6, aged 43.

Amos Davis, M.D. University of Louisville, 1874; a member of the Kentucky State and Ohio Valley medical associations; died at his home in Owensboro, Ky., November 9, from nephritis, aged 66.

George Francis Hinmers, M.D. University of Oregon, Portland, 1895; died at his home in Milwaukie, Ore., August 30, from injuries received from a fall from a wagon twelve hours before, aged 54.

Joseph Henry Kelley, M.D. Bellevue Hospital Medical College, 1884; a member of the Massachusetts Medical Society; died at his home in Worcester, Mass., November 10, from cerebral hemorrhage.

Stephen Hunt, M.D. Rush Medical College, 1881; a member of the Indiana State Medical Association; died at his home in Coatesville, Ind., November 8, from cerebral hemorrhage, aged 69.

Ben Davis, M.D. Kentucky School of Medicine, Louisville, 1908; a member of the Oklahoma State Medical Association; died at his home in Kinta, Okla., November 1, from typhoid fever, aged 31.

Frank Henry Hobbs, M.D. Medical School of Maine, Brunswick, 1900; a member of the Maine Medical Association; died at his home in Waterboro, Me., October 11, aged 55.

Cassius Emmet Van Matre, M.D. Miami Medical College, Cincinnati, 1895; a Fellow of the American Medical Association; died at his home in Newcastle, Ind., October 17, aged 44.

Eugene V. West, M.D. Meharry Medical College, Nashville, Tenn., 1892; a colored practitioner of Tampa, Fla., for twenty-two years; died at his home in that city, November 5, aged 45.

Isaac R. Dunning, M.D. Eclectic Medical Institute, Cincinnati, 1867; Rush Medical College, 1870; died at his home in Benton Harbor, Mich., August 19, from cardiac asthma, aged 71.

Francis M. Wilson, M.D. Louisville (Ky.) Medical College, 1884; a member of the Florida Medical Association; died at his home in Bartow, Fla., November 8, from heart disease, aged 55.

Jerome R. Lyon, M.D. Rush Medical College, about 1867; for forty-five years in active practice; died at his home in Excelsior Springs, Mo., October 1, from pneumonia, aged 91.

Frederick Leander Davis, M.D. Medical School of Maine, Brunswick, 1888; a member of the Maine Medical Association; died at his home in Biddeford, Me., October 9, aged 55.

William Blair, M.D. University of Louisville, Ky., 1875; a member of the Kentucky State Medical Association; died at his home in Glens Fork, Ky., November 12, aged 73.

Andrew Benjamin Bookins, M.D. University of Louisville, Ky., 1875; a practitioner since 1856; died in Jacksonville, Fla., September 21, from chronic nephritis, aged 80.

Lindley Ruddick, M.D. University of Louisville, Ky., 1882; a member of the Indiana State Medical Association; died at his home in Seymour, Ind., October 20, aged 70.

Eugene J. Hickey, M.D. University of Vermont, Burlington, 1907; a member of the Vermont State Medical Society; died at his home in Warren, Vt., October 7.

Samuel H. Smyth, M.D. New York Homeopathic Medical College, 1880; died at his home in New York City, November 1.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

WINE OF CARDUI

The Holston Conference of the Methodist Church Endorses this Fraudulent Nostrum

Ordinarily, THE JOURNAL would not consider giving the Wine of Cardui fraud and its exploiters any further publicity in these pages. Wine of Cardui, however, is again brought into the lime-light because of the action of its friends and beneficiaries. In this case, its friends are the official committee appointed by the Quarterly Conference of the First Methodist Church of Chattanooga, to which J. A. Patten, chief owner of the Wine of Cardui concern, belongs and the Holston Conference which officially accepted the "findings" of the committee.

We cannot state too emphatically that what follows is in no sense a criticism of the Methodist Episcopal Church. Letters we have received from earnest Methodists lead us to believe that the membership of that church, generally, takes the same attitude toward Wine of Cardui that THE JOURNAL has taken. We would also reiterate that nothing that has been said, or that may be said in the future, regarding John A. Patten is actuated by malice. THE JOURNAL has in mind not Mr. Patten, not the Chattanooga Medicine Company, not the Methodist Episcopal Church, but the thousands of sickly women over the country—and especially those in the South—who have been and are being cruelly deceived in the purchase of a fraudulent nostrum.

To the initiated, the idea of Mr. Patten or his business being critized in his own locality is sardonically humorous. The man is such a power in his own city and state that the outcome of any local "investigation" is a foregone conclusion. Nevertheless, the local committee made an "investigation" and the Chattanooga *Times* gave a very full account of its "findings." The matter in the *Times* has been reprinted in leaflet form and mailed from Post Office Drawer B, St. Elmo Station, Chattanooga, Tenn. This is the "return address" that appears on the envelopes in which letters are sent out by the "Ladies Advisory Department" of the Chattanooga Medicine Company.

WHAT SOME METHODISTS THINK

Before discussing the report of the committee, as published in the Chattanooga *Times*, the following facts are worth noting: John A. Patten is a member of the First Methodist Church of Chattanooga. The pastor of that church is—or was—Rev. C. H. Myers. Although no statement has been made by Mr. Myers regarding his opinion of John A. Patten, the most prominent member of his church, he does not appear to be in sympathy with either the methods by which Mr. Patten made his money or the influence which this money exercises in the church. After THE JOURNAL had exposed the Chattanooga Medicine Company's fraudulent business, Mr. Myers wrote Mr. Patten a personal letter—which has recently been made public—suggesting that it might be for the best interests of all concerned if he, Patten, would turn over the teaching of the men's bible class to some one else. In addition, Mr. Myers has openly protested against what he called the undemocratic power that was being exercised in the church.

A Chattanooga paper in reporting a statement made by Rev. Dr. Myers to the members of his church said: "Without becoming personal, he [Mr. Myers] condemned the leading members of the church, declaring they recognize money as the greatest power extant." A little later Mr. Myers nominated the stewards for his church. According to the newspaper reports at the time he "eliminated ten friends of John A. Patten from the Board of Stewards." The names of the "friends" who had been eliminated were given in the paper. It is worth noting that among these "friends" were three of the six whose names go to make up the committee that put its official O K on Mr. Patten and his business. These three were, respectively, the chairman, secretary and one of the members of the committee appointed by the Quarterly Conference.

Have You Tried It?
There is a bottle of Cardui waiting for you at the drug store. Have you tried it?
If not, we urge you to do so, before your troubles have obtained such a hold on you, that nothing will drive them out.
Even now, it may be nearly too late. But try it anyhow. If anything can help you, Cardui will. It has helped in thousands of cases, where other medicines had been tried in vain. Why should it not do the same for you?
Take CARDUI
The Woman's Tonic
"My daughter, Octava, would have been in her grave today, had it not been for that fine medicine, Cardui," writes Mrs. Laura Lawrence, of Drennon Springs, Ky.
"Nothing I tried helped my daughter, until she had taken Cardui. I had sent for the doctor, when I thought of your medicine and got a $1 bottle. When she had taken four doses she became all right. I often recommend Cardui to my friends."
Your druggist sells Cardui with full instructions for use on the bottle.
PAIN
leaves traces on every woman's face, that "beauty doctors" are quite unable to get rid of.
Pain digs wrinkles, and makes you look worn, faded and old, before your time.
To prevent women's unnecessary pains, take
CARDUI
The Woman's Tonic
This remedy is not a drug—does not deaden pain, but prevents it.
Taken as per directions inside the package, Cardui has prevented thousands of women from suffering pains that, up to then, they had thought it was necessary for them to endure.
They were wrong, and CARDUI was right.
Won't You test it?
Are You A Woman?
Nothing is more important to you, than health.
If a woman, you probably need a special medicine, especially prepared to cure the ills from which women suffer; a tonic to build up your failing strength and nervous energy.
Such a medicine is ready to your hand in Cardui, the woman's tonic.
For over 50 years Cardui has been in use as a remedy for female ills—a strengthening tonic for female weakness.
Gentle in action, safe, reliable, non-intoxicating and having absolutely no injurious after-effects, Cardui is a good

Some advertising (greatly reduced) issued in 1910—some years after John A. Patten admittedly controlled the business.

In the latter part of October the Holston Conference met in Cleveland, Tenn. One of its first official acts was to "accept" the Quarterly Conference's "exoneration" of Mr. Patten and his business. Moreover, when the conference had finished making its appointments, it was found that the Rev. C. H. Myers had been removed from the pastorate of the First Methodist Church, and had been assigned to an inferior position in another city, a position that he refused to accept. Mr. Myers, in a letter published in the Chattanooga *Times*, commenting on the action of the conference, said in part:

> "We have lost locally in our fight for a high principle, but the whole church will yet know and believe that such a bureaucratic system of church government cannot long exist as a power for righteousness. We are standing against a gigantic ecclesiastical machine, fed by an unlimited amount of money. Mammon has won."

ANOTHER MINISTER PROTESTS

Mr. Patten's pastor-that-was is not, however, the only churchman who has spoken against the sinister effect that Wine of Cardui money exerts on the Methodist Episcopal Church. Rev. G. T. Byrd, pastor of the First Methodist Church of Etowah, Tenn., (also in the Holston Conference) as long ago as last July arraigned the administration of that Conference. In a letter sent to the members of his conference and which a Chattanooga paper published in full under the sub-heading "Thinly Veiled Attack on J. A. Patten," Mr. Byrd charged among other things:

1. That the bishops seem to have "sacrificed their high sense of righteousness by accepting the influence of tainted money;"

2. That it was well-known and generally accepted "that the policies and appointments of the conference have had to have the endorsement of one prominent layman" before they were carried out;

3. That the church "is not dependent for its life and growth on the use of tainted money—money which comes from a product which government analysis shows to be 20 per cent. alcohol and which has frequently been condemned by medical journals;"

4. That although the "church has stood four-square on the liquor traffic" the mouths of the members are now "half-stopped while our consciences cry out against alcohol which stalks abroad under another name."

These facts are given to our readers in fairness to that part of the Holston Conference of the Methodist Episcopal Church which is protesting against the more-than-local dominance of the church by "patent medicine" profits.

CARDUI, *The* Tonic
For Women

Ladies! Remember that when hard work, worry, or sickness, has exhausted your vital energies, the thing for you to do is to take a tonic.

The tonic for ladies to take is CARDUI, the ladies' tonic.

You don't wear men's clothes.

Why should you take a man's tonic?

Much better stick to the one, tonic remedy, that is prepared especially for women, that acts upon the womanly organs, that has been found successful, in restoring weak women to health.

Take Cardui. It will help you.

If you want to know more about it, ask your druggist. He will tell you the truth.

Advertisement (greatly reduced) published in 1910. Wine of Cardui is the "ladies' tonic" — now; but some years ago the circular around each bottle of Wine of Cardui read: "IT HAS ALSO PROVED TO BE A FINE TONIC FOR MEN IN RESTORING WASTED ENERGIES."

THE QUARTERLY CONFERENCE INVESTIGATES

Now to refer to the "investigation" made by the official committee appointed by the Quarterly Conference of the First Methodist Church of Chattanooga. The committee was unanimously of the opinion, "after deliberate consideration," that in spite of the admitted fact that one-fifth of every bottle of Wine of Cardui is pure alcohol, yet, this is the only way in which the "drug content of the remedy" can be administered. Had there been an expert chemist or pharmacist on the committee he could have told them that it was unnecessary to use any alcohol. If the vegetable material is the part of the nostrum that possesses the marvelous qualities claimed for it, the drugs could be put up in tablet or pill form. The committee was further "satisfied" with a statement ascribed to druggists who had "never heard of its being used as a tipple or booze or used habitually." Self-respecting druggists—probably the class called on—would not, of course, be likely to know of the misuse of this preparation. The report does not indicate that any testimony was sought from the proprietors of country "general stores." In any case, was this committee innocent enough to expect the retailers of this alcoholic nostrum to admit that they had sold the stuff in quantities, or for purposes that were not legitimate?

PRESCRIBING ALCOHOL

The committee was further "satisfied" with the argument—also alleged to have been given by druggists—that many remedies commonly prescribed by physicians to sick women contain a much larger percentage of alcohol than does Wine of Cardui. It is, of course, doubtless true that there are some physicians who prescribe drugs unscientifically and absurdly. To this fact THE JOURNAL has called attention for years, and has devoted much more space to and placed more emphasis on this very evil than it has devoted to "patent medicine" frauds. That the modern, educated physician is in the habit of prescribing alcohol for sickly women is, however, a question that would have to be settled on better evidence than that presented through the Chattanooga committee. Even if it were true, though, what would it signify? Because a physician prescribes a few doses of an alcoholic tincture to a patient whose physical condition is known to him and who is under his immediate supervision and control, is that any justification for a "patent medicine" concern recommending a nostrum having alcohol as its essential constituent, to persons they have never seen and the nature of whose ailments they do not, and could not, understand? To argue that because dangerous drugs are prescribed by physicians such drugs may legitimately be sold indiscriminately is absurd. Because dynamite and blasting powder are used by, and sold on the order of, mining experts and civil engineers is no excuse for permitting every country store to sell dynamite and blasting powder to anyone it sees fit.

"EVIDENCE" OF CURES

The committee further reported that it found "abundance of evidence to inspire in the manufacturers" of Wine of Cardui the belief that it "cures" the ailments for which it is recommended to the public. What this evidence was the committee did not disclose. The absurdity and futility of a group of laymen (there were no physicians on the committee so far as the report indicates) passing on questions of therapeutic efficiency, is self-evident. Presumably, the committee read the various testimonials that form so large a part of the Chattanooga Medicine Company's advertising material. It might be suggested at this point that the same committee could have found equally abundant evidence to prove the prophylactic powers of the left hind foot of a rabbit caught in a churchyard in the dark of the moon! And this evidence would have just the same scientific value as that of the average testimonial for Wine of Cardui or any other nostrum or method of treatment.

THE NOSTRUM MAKER'S SHEET ANCHOR—MYSTERY

In answer to THE JOURNAL's charge that nothing having therapeutic effects could be found in Wine of Cardui other than the alcohol, the committee says that it was "shown many authorities to the effect that it is very difficult for any chemist to analyze a vegetable compound such as this and be sure of its contents." The old, old argument of the nostrum exploiter — mystery! While technically it may be true that there are some vegetable extractives whose identity cannot be positively determined by chemical analysis, it is equally true that the active ingredients of practically every substance having any medicinal property can be identified. The fact that the chemist cannot name all of the plant extractives that enter into a nostrum such as Wine of Cardui, is of no practical importance. The essential drug in this nostrum is the alcohol, and it is the only drug demonstrably present in sufficient quantities to give any appreciable therapeutic effect.

As a general nerve and system tonic, for women, you will find no remedy to compare with Cardui, the Woman's Tonic.

One of its strongest points is the fact that it is a purely vegetable preparation; hence, no matter for how long a time it may be used, its ingredients do not accumulate in the system, like mineral ingredients frequently do.

Cardui is harmless, non-intoxicating, and its use is sure to benefit young and old.

Druggists do not sell the Cardui ingredients in bulk. They are imported direct by us, so the only way to get the benefit of the Cardui medicinal value is to get the genuine Wine of Cardui, in original packages, as sold by the druggist whose name is printed on the front page of this magazine.

Try Cardui, today.

Advertisement (reduced) published 1910. Read it carefully and then ask whether THE JOURNAL is justified in criticizing Wine of Cardui and its exploiters.

PATTEN'S ADVERTISING

In discussing THE JOURNAL'S criticisms of the Wine of Cardui advertsing, the committee stated that there were two classes of advertising that had been criticized, (1) that which was printed before Mr. Patten took charge of the company and (2) that which was found in a book entitled, "Home Treatment for Women." This statement is but a half-truth. THE JOURNAL presented advertisements that had been pub-

lished years after Mr. Patten had admittedly been in control, in addition to the claims that were made for the nostrum in the "Home Treatment for Women" booklet. THE JOURNAL went further. It gave photographic reproductions of the advertisements with a statement beneath each calling attention to the date on which the advertisements appeared! One of these reproductions was of an advertisement which in large, blackfaced type urged "young girls" to take Wine of Cardui. It contained the statement that Wine of Cardui is "non-intoxicating." This untruth used to appear on the Wine of Cardui labels in the days before the Food and Drugs Act was passed and it continued to appear in the circular around the bottle for some time after the Food and Drugs Act was passed.[1] It contained the further statement that Wine of Cardui is "perfectly harmless" — another lie that appeared on the label before the Food and Drugs Act was passed. Had the committee been more intent on giving the public a plain unvarnished statement of facts regarding the methods of the Wine of Cardui concern than it was, apparently, in wielding the "whitewash brush," it could have found many other fraudulent claims made for the nostrum other than those that THE JOURNAL has brought out.

Mr. Patten claims to have assumed control of the Wine of Cardui business in 1905, and he insists that the business should be judged according to the advertising issued since that time. This is exactly what THE JOURNAL has done. The advertising which THE JOURNAL has criticized most severely is that which was being issued in 1914; other claims just as fraudulent were reproduced from advertisements published in 1910—five years after Mr. Patten admits he assumed control. But the attempt of Mr. Patten to dodge behind a technicality, while in keeping with the tactics of "patent-medicine" fakers, is not such as to inspire respect for him or his business in the eyes of decent people. We have evidence to show that Mr. Patten was placing Wine of Cardui advertisements years before he assumed open control. Certain it is that Mr. Patten was connected with, and a beneficiary of, the Wine of Cardui business many years before his admitted complete control. He was receiving money from this wretched business when the advertising was vile, loathsome and indecent.

But as Mr. Patten has claimed that since he assumed charge the advertising has been "free from curative claims that could be regarded as extreme or subject to any fair criticism," let us quote some more:

". . . of the utmost value in relieving pain, regulating the menses, curing leucorrhea, preventing miscarriage and making childbirth easy." [*Claim made in 1909.*]

"It is a reliable, scientific, non-intoxicating, harmless medicine for all females, at puberty, maturity, pregnancy and during the change of life." [*Claim made in 1909.*]

"No matter how serious or long standing the trouble Cardui will help you. It is a mild vegetable tonic remedy especially adapted to relieve and cure the common womanly ailments." [*Claim made in 1912.*]

"For young girls just entering into womanhood and young ladies whose life duties have not long begun, Cardui is often of vital importance, giving them strength for daily tasks." [*Claim made in 1910.*]

"It [Cardui] is a pure non-intoxicating preparation . . ." [*Claim made in 1910.*]

"Its ingredients help build up vitality, tone up the nerves and strengthen the entire womanly constitution. It is mild and harmless." [*Claim made in 1914.*]

"This remedy [Cardui] is not a drug—does not deaden pain, but prevents it." [*Claim made in 1910.*]

"Cardui acts on the cause of the disease [Vaginitis] and is therefore not a mere palliative, but a scientific and specific remedy, with a curative effect upon the seat of the trouble." [*Claim made in 1914.*]

"Cardui acts medicinally on the ovaries and tubes, and on all their surrounding parts, gradually subduing the inflammation, stopping pain and relieving the congestion." [*Claim made in 1914.*]

"Cardui is harmless, non-intoxicating . . ." [*Claim made in 1910.*]

"As a general nerve and system tonic for women, you will find no remedy to compare with Cardui, the Woman's Tonic." [*Claim made in 1910.*]

PUBERTY

At this critical time in a girl's life, she needs care, patient attention, motherly advice, and—Cardui. For want of proper moral and medical assistance, many a girl has grown up into a weak, nervous woman.

Every girl should take Cardui at the time of puberty. It can never do her anything but good.

MARRIAGE

All newly married women should take Cardui. It will afford them a gentle, sustaining refreshment, soothe their nerves, tone up their organs, and regulate all their functions.

PREGNANCY

The value of Wine of Cardui to pregnant women lies—

First.—In the fact that it will assist in making childbirth easier, by reason of its gentle, building, tonic, strengthening effect on the female organs and sexual parts, concerned in the birth of the coming child.

Second.—In the fact that it acts as a general strengthener and builder of the entire constitution, and, if its use is persisted in during the whole term, in connection with the general rules of health given in this book, both mother and child will reap benefit, in added health, strength and life-force.

No one need be afraid of taking Cardui during pregnancy. Its action is gentle and strengthening, and it can never do anything but good.

MISCARRIAGE

Wine of Cardui should always be taken, during the entire term of pregnancy, by every woman who has the least suspicion of being likely to miscarry, and by all women whose weakness, poor health and poor blood, would indicate that they might find it difficult to carry their child the full term, or painful to bear it.

CHANGE OF LIFE

Cardui should be taken regularly, on the first sign of the coming change, and its use continued throughout the entire period. By this means, all the disagreeable symptoms will

Photographic reproductions (reduced) from the booklet "Home Treatment for Women," sent out early this year (1914). After THE JOURNAL'S exposé a denatured edition of this booklet was issued.

THE JOURNAL'S ALLEGED "STRAINED INTERPRETATIONS"

The above are some of the claims made by the Chattanooga Medicine Company for Wine of Cardui *since* Mr. Patten has admittedly had charge of affairs. As to the other claims quoted in THE JOURNAL'S article, taken from the booklet, "Home Treatment for Women" (sent out in 1914), these the committee gloss over with the admission that while their "phraseology" is "careless" THE JOURNAL'S "interpretation" of the statements is "strained." Was it strained? THE JOURNAL called attention to the fact that women are urged to take Cardui for "hanging breasts." Let us quote the entire paragraph so that our readers can determine whether or not our interpretation is strained:

"At the least tenderness, soreness, swelling, discharge of milk-like fluid, *lack of tone, shown by hanging breasts,* or change in the color of the areola, not caused by pregnancy, *it is time to take Cardui.*" [Claims made 1914. Italics ours.—ED.]

THE JOURNAL said that Mr. Patten's company recommended this alcoholic nostrum for gonorrheal infection of the vulva; was it justified in so saying? Again, let the matter be quoted in full:

"Local diseases of the vulva are, principally, heat, inflammation and itching, and are frequently caused by want of cleanliness. Very often, however, *they are caused by gonorrheal infection,* or by disease of the

1. For some time after the passage of the Food and Drugs Act, many "patent medicine" makers held that the circular around the bottle did not come within the scope of the Act. Hence, while they deleted the lies from the *labels* of their nostrums, they continued to falsify in the *circulars* wrapped around the bottles. The history of the "patent medicine" business shows that the average nostrum maker will lie just so long as he can do it with safety.

womb, ovaries, or vaginal canal, which causes irritating and poisonous secretions.

"*Cardui will exert marked beneficial effect upon this local irritation,* by relieving the inflammation which causes it; but, in addition to general treatment, local treatment should also be carefully carried out, the outer parts washed with castile or palm oil soap and warm water, and well dried, at least once a day, after which a little powdered boracic acid may be dusted on." [Claims made 1914. Italics ours.—ED.]

This advertisement appeared in October, 1911. In the original it measured 11 inches by 10 inches.

THE JOURNAL further said that Wine of Cardui was recommended for suppressed menstruation and also for "flooding." Was it justified in saying so? Again let us quote:

"Besides the two special forms of menstrual disorder described above [*amenorrhea* and *menorrhagia*], there may be, as stated, others, such as *scantiness, irregularity* of the functions, painful periods, etc., *all of which can nearly always be cured by persistent treatment with Cardui.*" [Claims made 1914. Italics ours.—ED.]

THE JOURNAL said, too, that Mr. Patten's concern recommended that all newly married women should take Cardui. Was the "interpretation" in this case "strained?" Let us quote in full:

"*All newly married women should take Cardui.* It will afford them a gentle, sustaining refreshment, soothe their nerves, tone up their organs, and regulate all their functions." [Claims made 1914. Italics ours.—ED.]

THE JOURNAL also accused the Chattanooga Medicine Company of making the villainous suggestion that every girl should take Cardui at the time of puberty. Was this accusation just?

"At puberty, the girl blossoms out like a flower from the opening bud. Her figure becomes fuller and rounder; her busts swell, and are often sore and tender; her voice becomes sweeter; hair begins to show itself under the armpits and on the lower abdomen.

"*At this critical time in a girl's life, she needs* care, patient attention, motherly advice, and—*Cardui.* For want of proper moral and medical assistance, 'many a girl has grown up into a weak, nervous woman . . .'

"*Every girl should take Cardui at the time of puberty.* It can never do her anything but good." [Claims made 1914. Italics ours.—ED.]

We could, if space permitted, show in detail that the charges of THE JOURNAL against the claims made for Wine of Cardui were in every instance understated rather than overstated; that THE JOURNAL's "interpretation" of the claims made by the Chattanooga Medicine Company instead of being "strained" was, in fact, more than justified.

Lastly, the committee decided that the owners of the Chattanooga Medicine Company were not morally culpable and "there could be no basis for any such charge unless it was shown that the medicine is worthless." As a matter of fact, even if Wine of Cardui had valuable drugs in it, the fraudulent claims under which it has been sold would still render its exploiters morally culpable. The committee summed up its findings with the statement that its investigation disclosed nothing which, in its opinion, "would prevent an intelligent and conscientious man" from engaging in the Wine of Cardui business, "from the point of view of either morals or religion." In other words, the Quarterly Conference of the First Methodist Church of Chattanooga—the Holston Conference, concurring—sees nothing either immoral or irreligious in the sale of a nostrum whose essential constituent is alcohol; sees nothing immoral or irreligious in the exploitation, under fraudulent claims, of this preparation to every adolescent girl, to every bride, to every expectant mother and to every woman at the menopause!

As we have said before, THE JOURNAL does not believe that this local official "whitewashing" is representative of the views of the majority, or of any substantial minority, of the members of the church in which Mr. Patten plays such an important part. It is true that a certain part of Methodist officialdom is standing up for Patten and his wretched business. Some of the *Christian Advocates* have come, editorially, to Mr. Patten's rescue, urging their readers to suspend judgment until Patten's suit for libel against THE JOURNAL has been decided. But Mr. Patten, it should be remembered, is chairman of the Book Committee which (1) annually fixes the salaries of all official editors, which (2) has power to discontinue any official Methodist publication, and which (3) has, in fact, "general supervision and direction of the publishing interests" of the church. These facts should, in fairness, be remembered in extenuation of the action of those editors who come so valiantly to the defense of the manufacturer of Wine of Cardui.

WHY REJECT ADVERTISEMENTS OF WINE OF CARDUI

On the other hand it must again be emphasized that no official publication of the Methodist Episcopal Church

SHE WAS SHUT-IN FOR TWELVE YEARS
A St. Louis Lady Tells How Good It Feels to Be Out Again, After Twelve Years of Invalidism.
CARDUI WORKED WONDERS

Another advertisement published in 1911. The original occupied more than 150 square inches of space.

accepts the advertisements of Wine of Cardui! Yet if Wine of Cardui can do half that Mr. Patten's company has claimed for it, it can accomplish more than any preparation known to medical science. If it can exert "beneficial effect" in gonorrheal vulvitis; if it is a "specific remedy" in gonorrheal vaginitis; if it has "cured" the wombs of "over a million women;" if it can "nearly always" "cure" amenorrhea, menorrhagia, "scantiness, irregularity of the functions, painful

periods, etc.;" if it is what every girl at puberty "needs;" if it is something that "all newly married women should take;" if it "will assist in making childbirth easier;" if it is something the lying-in woman should take "two or three times a day;" if the woman at the menopause should take and continue its use "through the entire period"—if these are the powers and the potentialities of Wine of Cardui, then indeed are the Methodist publications remiss in their duty to humanity. If this nostrum possesses the powers claimed for it—claims which two Methodist conferences have accepted as reasonable and true—then the editors of the various *Christian Advocates* are derelict in not accepting advertisements of the product of the Chairman of their Book Committee—Wine of Cardui, The Woman's Tonic.

Correspondence

Do Patent Medicines Control the Press? An Example

To the Editor:—Any suggestion that the daily press is subservient to dishonest advertising interests is received with instant and fervid indignation by 95 per cent. of the newspapers. Just about this percentage takes money for obviously crooked advertising, in the form of quack medical "copy." As the object of much of this virtuous journalistic wrath on account of my recent novel "The Clarion," I wish to point out an instance in the career of the book itself which curiously supports my contention.

Binghamton, N. Y., is the home of Swamp Root, a conspicuous "booze-medicine" which I exposed a few years ago in *Collier's Weekly*. It is a prosperous and thriving city of almost 55,000 inhabitants, served by two local newspapers, the *Press* and the *Republican-Herald*. Just before the appearance of "The Clarion," the publishers sent to the *Press* an advertisement of the book specially designed to arouse the local interest of a city largely devoted to the patent medicine industry. The copy was returned with the following letter:

Binghamton, N. Y., Sept. 30, 1914.

Houghton Mifflin Company, 4 Park St., Boston, Mass.

Gentlemen:—We are returning, herewith, your order of the 28th inst., for "The Clarion" with copy, as we do not care to handle same. Thanking you for the proposition, we are

Very truly yours,
The Binghamton Press.

On the theory that this particular form of wording had been deemed too pointed, one of the regular advertisements of the book was sent. This also was refused, with the following suggestive intimation:

Binghamton, N. Y., Oct. 9, 1914.

Houghton Mifflin Company, 4 Park St., Boston, Mass.

Gentlemen:—We are returning, herewith, your copy of the 7th inst., for "The Clarion." We greatly prefer not to handle any advertising for this particular book. Thanking you for the offer, we are

Very truly yours,
The Binghamton Press.

As the *Press* had formerly been owned by the Kilmers, proprietors of Swamp Root, its indisposition to advertise a work dealing with the proprietary medicine evil might be attributed to a legacy of loyalty to old standards. No such inhibition would apply to the *Republican-Herald*. The first, or local advertisement was sent to that office, bringing with it tribulation of spirit to the business staff. They did not like to reject the advertising. All newspapers particularly appreciate publishers' business, as a mark of "class." But they felt evidently, that the proffered "copy" was too near home, and they wrote asking if it could not be modified somewhat. Thereupon the regular stock advertisement of the book was forwarded. What occurred in the office in the meantime is a matter of conjecture only. But the outcome is sufficiently significant. "Owing to a peculiar agreement existing between the Binghamton newspapers" (I quote from the letter of the advertising agency acting for the publishers) the *Republican-Herald* felt compelled to decline all advertising of this particular book!

Meantime the local book-stores refused to order it, although it was having one of the largest advance sales of the year in other parts of the country. One store made no secret of the fact that fear of the Swamp Root interests kept the novel off their shelves. It was not even obtainable at the local public library. Since this letter was written, however, I understand that the library has put it in, and the book department of a general merchandise store which at first rejected it, is now carrying the book.

All of which would seem to indicate that my fictional city of "Worthington" with its press under the domination of "our leading citizen," Dr. Surtaine of "Certina" fame, is not perhaps so wholly absurd and foundationless as the New York *Times*, the San Francisco *Chronicle* and others of the noble band of newspaper defenders would have their public believe. Samuel Hopkins Adams, Auburn, N. Y.

Shields in Vaccination

To the Editor:—Will you give me space in The Journal in which to protest against the still too frequent use of "shields" in covering vaccination wounds? In routine vaccination work it has recently been my lot to examine many arms, a number of which I have dressed after the persons had applied shields, on their own initiative, or often on the advice of some physician. Others, having large, ugly cicatricial evidence of former pyogenic infection, too frequently give a history of having worn shields. I have removed shields and have seen a collection of accumulated pus roll down the arm, the patient thinking this a natural result of the "take." Shields are usually perforated for supposed ventilation, the perforation in reality serving to admit germ-laden dust and dirt of various kinds. The shield prevents cleansing of the wound, and gives the patient a false sense of proper protection. There is not a doubt that shields have been the direct cause of many seriously infected arms, thus in many instances causing the public to antagonize a most valuable prophylactic procedure. Shields are an abomination and a danger, and I should like to suggest that they be made a subject for comment in your department of Propaganda for Reform. They are far more dangerous than many patent medicines, as the latter are often harmless in themselves, while the former are a source of danger. It should be impressed on the profession, and the public, that a vaccination wound should have the same carefully applied sterile dressing as any other wound or sore, and that such dressing is much cheaper and simpler. These shields are manufactured by reputable firms who would, no doubt, refrain from placing them on the market if sufficient effort were made by clinicians to impress the makers with a knowledge of their dangers.

Alfred G. Farmer, M.D.,
Colon Hospital, Cristobal, C. Z.

Danger of War News

To the Editor:—It is time the medical profession impressed on the public the danger arising from too much reading and thinking of the war and its tragedies. Consideration of the vastness of the war, with its unnumbered and unspeakable atrocities and its suffering, overstimulates and weakens the mental fiber, and this soon reacts on the physical state of the individual. The husband neglects his wife, the mother her child, sleep is lost, appetite and digestion are impaired by reading of Belgium and blood, Prussia and pillage, Germany and guns, Servia and shrapnel, cholera, ruins, rape, hunger, cold, wounds, widows, orphans, destruction, despair, drunkenness and death. Daily the press of the country places before our greedy eyes all the printable horrors, and as we grasp our paper we breathe a curse or prayer according to the tenor of the latest despatch. The danger of this is increased by the constantly changing results of the vital conflict. The rapid shift from overstimulation of our emotions to deep depression causes increased blood-pressure, cerebral congestion, nervousness and irritability and may lead to imagined or real physical degeneration. Also it is to be remembered that the constant and earnest reader, espe-

cially he who is naturally emotional or neurotic, suffers from this overstimulation and depression for an indefinite time. The excitement and depression is quite different from that bred of a horse race or prize fight, in which our emotions undergo rapid change for only a short time, and yet we know that cases of collapse and even sudden death have occurred at such events. The ending of the present war may be far in the future, and the harrowing conditions of our fellow men meanwhile will probably become more extreme and more pitiable, while it may be that our doubts and depressions will become more marked. Another bad influence is the uncertainty of the reports we hear, so that we are exposed to frequent and swift revulsions of feeling, uplifts and downthrusts of the mental scale. As a matter of fact, we suffer far more from apprehension of doubt of the issue of events than from the event itself; in the present instance, moreover, our mental impressions are so chaotic that confusion is caused by the simple process of attempting to grasp what is going on.

What we need now especially is to conserve our energy and stop this fretting, worrying, nerve-racking and useless occupation of reading and discussing harrowing details. Each of us should look at this terrible thing soberly, quietly and broadly, not allowing an emotional element to enter the subject; for so soon as we do, our good judgment and balance is sent tumbling toward hysteria and nerve exhaustion. GURNEY WILLIAMS, M.D., Atlantic City, N. J.

The Cammidge Reaction in the Urine—Dextrinuria

To the Editor:—In THE JOURNAL, Oct. 31, 1914, p. 1531, which has just reached me, you comment on an article by Pekelharing and Van Hoogenhuyze (*Ztschr. f. physiol. Chem.*, 1914, xci, 151) on this subject and state that these observers suggest that the reaction is due to a dextrinuria. May I point out that in a paper which I read before the Medical Section of the Seventeenth International Congress of Medicine in London in August, 1913, on a quantitative method of performing the so-called "pancreatic" reaction, I stated that the reaction is due to the presence of a substance "intermediate between sugar and glycogen," thus hinting at its being a dextrin? Shortly afterward I was able to complete the evidence and, in conjunction with my chemical assistant, Mr. Howard, I wrote a paper entitled "Observations on the Composition and Derivatives of Urinary Dextrin," which, after some unavoidable delay, appeared in the *Lancet*, Sept. 26, 1914, p. 791. An abstract was given in THE JOURNAL, Oct. 24, 1914, p. 1508. In this paper the formula of the dextrin, which we isolated in a number of cases, was worked out and its probable relation to glycogen and starch shown. We were able to prove that the "pancreatic" reaction depends on the formation of an osazone by the pentose (xylose) split off from the dextrin by hydrolyzing with hydrochloric acid and that in the quantitative method the "iodin coefficient" of the urine is a measure of its content of dextrin. Our observations on the dextrin excretion are in agreement with those you quote, but we were also able to study the effect on the output of diseases of the pancreas, early glycosuria, and frank diabetes. One practical outcome of our observations has been to show that the appearance of sugar in the urine in diseases of the pancreas is preceded by a marked rise in the excretion of dextrin, which falls when glycosuria is established. It would therefore seem that determinations of the "iodin coefficient" are not only useful in the diagnosis of disease of the pancreas, but also afford a means of detecting and therefore treating diabetes in the preglycosuric stage with consequent better chance of success. In view of these and other results I think we can fairly claim to have established dextrinuria as a clinical entity, and it seems probable that the further investigations on which I am engaged will furnish information of value in relation to carbohydrate metabolism both in health and disease. In conclusion may I again state that neither the "pancreatic" reaction nor its modification, "the iodin coefficient" of the urine, has ever been claimed by me to be a specific test for disease of the pancreas? For several years I have stated that in my opinion it is merely an evidence of perverted carbohydrate metabolism which, when taken in conjunction with other evidence, is of assistance in the diagnosis of disease of the pancreas, since imperfect functioning of that organ is the most common cause of a metabolic failure in this direction.

P. J. CAMMIDGE, M.D., London, England.

Unauthorized Use of Name

To the Editor:—A display advertisement appeared in a Dubuque paper November 6 of the following verbiage:

"Mineral Water Mud Baths Cure Rheumatism at the Old Sanitarium, Prairie du Chien, Wisconsin. F. J. Antoine, Phy. Dr. Edward Evans, Sur."

My name was used without either my knowledge or consent. I have on file affidavits from the editor of the paper and the owner of the sanitarium saying that this advertisement was inserted without my knowledge or consent. You will confer a favor if you will insert this note in your Correspondence column. E. EVANS, M.D., La Crosse, Wis.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

QUESTIONS OF CORRECT LANGUAGE: "COCCI," "APPENDECTOMY" AND "SCOPOLAMIN"

To the Editor:—1. What is the proper pronunciation of words terminating in "cocci" and "coccic"? I sometimes hear the double "c" pronounced as if it were "k," sometimes as if it were "x" and sometimes as if it were "s."

2. What is the proper word to use to indicate the removal of the appendix, appendicectomy, appendiectomy or appendectomy?

3. What is the correct pronunciation of "scopolamin?" The latest dictionary puts the accent on the "a" but practically all physicians put it on the "o." I confess that euphony seems to be in favor of the pronunciation given by the physicians.

J. F. B., Columbus, Ohio.

ANSWER.—1. The double "c" in "cocci" and "coccic" should be given the ordinary English pronunciation, the first "c" hard like "k" and the second soft like "s."

2. There seems no valid reason why the consideration of brevity should not prevail, giving the choice to "appendectomy." "Appendicectomy" is sometimes preferred on etymological grounds, but such considerations seem an unnecessary refinement since the word, being a hybrid, has no etymological right to exist.

3. Both euphony and derivation favor the accent on the second "o." Scopolamin does not belong to the class of amins; it is merely the alkaloid derived from scopola.

EXPOSURE AND IMMUNITY TO DIPHTHERIA

To the Editor:—1. Will you please inform me whether an adult having been in the same room with an individual who developed diphtheria the following day, but not in close contact, should be subjected to an immunizing dose of antitoxin, though she herself has had diphtheria?

2. Would your opinion be otherwise, if that individual were a teacher?

3. Is it not a fact that the majority of adults have a natural immunity to diphtheria?

4. Is it not a fact that the vast number of individuals who have once had diphtheria are immune to a second attack?

5. For how long does an immunizing dose render an individual passively immune?

A. R. HATCHER, M.D., Wellington, Kan.

ANSWER.—1. An adult exposed to diphtheria should be advised to receive an immunizing dose of antitoxin.

2. If the person is a teacher, she is bound to take every proper precaution.

3. The majority of adults have no marked immunity to diphtheria although they are less frequently attacked than children.

4. The immunity following an attack of diphtheria is very transient, lasting usually not more than three months.

5. An immunizing dose of antitoxin offers protection against the disease for a few weeks only.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ALABAMA: Montgomery, Jan. 5, 1915. Chairman, Dr. W. H. Sanders, Montgomery.

ALASKA: Juneau, Jan. 5, 1915. Sec., Dr. H. C. DeVighne, Juneau.

ARIZONA: Phoenix, Jan. 5-6, 1915. Sec., Dr. John Wix Thomas, 200 Nat'l Bank of Ariz. Bldg., Phoenix.

CALIFORNIA: Los Angeles, December 8. Sec., Dr. Charles B. Pinkham, 727 Butler Bldg., San Francisco.

DELAWARE: Dover and Wilmington, December 8-10. Sec., Dr. H. W. Briggs, 1026 Jackson St., Wilmington.

ILLINOIS: Chicago, Jan. 13-15, 1915. Sec., Dr. C. St. Clair Drake, Springfield.

INDIANA: Indianapolis, Jan. 12-14, 1915. Sec., Dr. W. T. Gott, State House, Indianapolis.

KENTUCKY: Louisville, December 16-18. Sec., Dr. A. T. McCormack, Bowling Green.

MARYLAND: Baltimore, December 8. Sec., Dr. J. McP. Scott, 137 W. Washington St., Hagerstown. Homeopathic, Baltimore, December 15-16. Sec., Dr. O. N. Duvall, 1817 N. Fulton, Baltimore.

MINNESOTA: Minneapolis, Jan. 5-8, 1915. Sec., Dr. Thomas McDavitt, 814 Lowry Bldg., St. Paul.

MISSOURI: St. Louis, December 14-16. Sec., Dr. J. A. B. Adcock, State House, Jefferson City.

NEW HAMPSHIRE: Concord, December 29-30. Regent, Mr. H. C. Morrison, Concord.

NEW MEXICO: Santa Fe, Jan. 11, 1915. Sec., Dr. W. E. Kaser, E. Las Vegas.

NORTH DAKOTA: Grand Forks, Jan. 5, 1915. Sec., Dr. G. M. Williamson, Grand Forks.

OHIO: Columbus, December 8-10. Sec., Dr. George H. Matson.

OKLAHOMA: Oklahoma City, Jan. 12-14, 1915. Sec., Dr. John W. Duke, Guthrie.

PENNSYLVANIA: Philadelphia, December 1-3. Sec., Dr. N. C. Schaeffer, Harrisburg.

RHODE ISLAND: Providence, Jan. 7, 1915. Sec., Dr. Gardner T. Swarts, State House, Providence

SOUTH DAKOTA: Pierre, Jan. 12, 1915. Sec. Dr. P. B. Jenkins, Waubay.

UTAH: Salt Lake City, Jan. 4-5, 1915. Sec., Dr. G. F. Harding, 407 Templeton Bldg., Salt Lake City.

VERMONT: Montpelier, Jan. 11-13, 1915. Sec., Dr. W. Scott Nay, Underhill.

VIRGINIA: Richmond, December 15-18. Sec., Dr. J. N. Barney, Fredericksburg.

WASHINGTON: Walla Walla, Jan. 5, 1915. Sec., Dr. C. N. Suttner, Baker Bldg., Walla Walla.

WISCONSIN: Madison, Jan. 12-14, 1915. Sec., Dr. John M. Beffel, 3200 Clybourn St., Milwaukee.

Connecticut July Report

Dr. Charles A. Tuttle, secretary of the State of Connecticut Medical Examining Board, reports the oral, practical and written examination held at New Haven, July 14-15, 1914. The total number of subjects examined in was 7; total number of questions asked, 70; percentage required to pass, 75. The total number of candidates examined was 20, of whom 17 passed and 3 failed. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Yale Medical School	(1911) 81; (1914) 87.9, 89.2		
University of Louisville		(1903)	83.6
College of Physicians and Sur., Baltimore	(1913) 76.7; (1914)		75.1
University of Maryland		(1914)	84
Harvard University		(1901)	82.5
Tufts College Medical School	(1905) 76.2; (1913)		78.5
College of Phys. and Surgs. in the City of N. Y.	(1902) 89.5; (1903) 83.3.		
Syracuse University		(1913)	76.7
Jefferson Medical College		(1914)	84.7
University of Pennsylvania		(1913)	83.7
University of Vermont	(1913) 75.4; (1914)		88.8
	FAILED		
University of Southern California		(1902)	61.8
Maryland Medical College		(1913)	65.2
University of Canatania, Italy		(1912)	64.9

Michigan Reciprocity Report

Dr. B. D. Harison, secretary of the Michigan State Board of Registration in Medicine, reports that 32 candidates were licensed through reciprocity from February to September, 1914. The following colleges were represented:

College	Year Grad.	Reciprocity with
University of Colorado	(1911)	Colorado
Bennett Medical College	(1912)	Illinois
College of Phys. and Surgs., Chicago	(1907)	Missouri
Hahnemann Medical Coll. and Hosp., Chicago	(1910)	Texas
Northwestern University	(1906)	Illinois
Rush Medical College	(1901) (1907) (1912)	Illinois
University of Illinois	(1912)	Illinois
University of Louisville	(1907)	Illinois
College of Phys. and Surgs., Baltimore	(1912)	Maryland
University of Maryland	(1908)	N. Carolina
Harvard University	(1912)	Illinois
University of Michigan, Homeo. Med. College	(1907)	Ohio
University of Minnesota	(1908)	Minnesota
Missouri Medical College	(1895)	Missouri
St. Louis University	(1913)	Missouri
Syracuse University	(1906)	New York
Cincinnati College of Med. and Surg	(1879)	Indiana
Cleveland College of Phys. and Surgs	(1905)	Ohio
Cleveland Homeo. Medical College	(1898)	Ohio
Eclectic Medical College, Cincinnati	(1913)	Ohio
Starling Medical College	(1897); (1903)	Ohio
Starling-Ohio Medical College	(1912)	Ohio
University of Wooster	(1887)	Ohio
Western Reserve University	(1912)	Ohio
Jefferson Medical College	(1910)	Minnesota
Woman's Medical College of Pennsylvania	(1908)	Penna.
University of Vermont	(1908)	Vermont
Marquette University	(1913)	Wisconsin
Victoria University, Ontario	(1874)	Minnesota

Oklahoma Reciprocity Report

Dr. John W. Duke, secretary of the Oklahoma State Board of Medical Examiners, reports that sixteen candidates were licensed through reciprocity from April 14, to July 14, 1914.

College	Year Grad.	Reciprocity with
University of Arkansas	(1910)	Arkansas
College of Phys. and Surgs., Chicago	(1901)	Wisconsin
Indiana Medical College	(1906)	New Mexico
University of Michigan, Homeo. Med. College	(1908)	Arkansas
Boston University	(1891)	Arkansas
Ensworth Medical College	(1910)	Nebraska
Meharry Medical College	(1913, 3)	Tennessee
Memphis Hosp. Medical College	(1902) Texas; (1912)	Tennessee
Tennessee Medical College	(1908)	Tennessee
University of Nashville	(1908)	Tennessee
University of Tennessee	(1900)	N. Carolina
Baylor University	(1913)	Tennessee
Physio-Medical College of Texas	(1905)	Texas

Utah July Report

Dr. G. F. Harding, secretary of the Utah State Board of Medical Examiners, reports the written examination held at Salt Lake City, July 6-7, 1914. The total number of subjects examined in was 19; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 6, of whom 5 passed, including 1 osteopath, and 1 failed. Two candidates were licensed through reciprocity. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Rush Medical College		(1912)	84.8
University of Illinois		(1914)	86.9
Jefferson Medical College	(1913) 81.4; (1914)		85.2
	FAILED		
Meharry Medical College		(1914)	61

College	LICENSED THROUGH RECIPROCITY	Year Grad.	Reciprocity with
Missouri Medical College		(1883)	Wyoming
St. Louis College of Phys. and Surgs.		(1905)	Illinois

Vermont July Report

Dr. W. Scott Nay, secretary of the Vermont State Board of Medical Registration, reports the practical and written examination held at Burlington, July 14-16, 1914. The total number of subjects examined in was 13; total number of questions asked, 90; percentage required to pass, 75. The total number of candidates examined was 23, all of whom passed. One candidate was licensed through reciprocity. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Harvard University		(1905)	85.9
University of Vermont	(1912) 82.2; (1913) 81.7, 82.6; (1914) 76.4, 80.1, 81.5, 83.1, 84.1, 84.5, 84.5, 84,7, 85.2, 85.7, 85.7, 86.2, 86.8, 87, 87.2, 87.5, 87.5, 89, 93.6.		

One candidate, a graduate of Dartmouth Medical School, 1913, was licensed through reciprocity with New Hampshire.

Book Notices

FROHSE ANATOMICAL CHARTS. Made under the supervision and assistance of the Institute of Anatomy, University of Berlin. Fourteen charts, with key to each chart. Price, $3.75 per chart. Chicago: A. J. Nystrom & Co., 1914.

This is an excellent series of fourteen wall charts illustrating human anatomy. More are promised. It consists so far of the following: skeleton and joints, 2; muscles, 2; viscera of thorax and abdomen, 4; peripheral nerves, 1; circulatory system, 1 (diagrammatic); ear, 1; eye, 1; median section through head and neck, 1; histology of skin, 1. Most are of life size, while those of the eye and ear and the median section through the head and neck are considerably enlarged. They are made from paintings which were planned and supervised by anatomists. They are admirably planned to show clearly and intelligibly the structures represented, and their scope includes the whole extent of those structures. They approach more closely to perfect anatomic accuracy than most representations of this kind. The painter, in making the main features stand out clearly and distinctly, has intentionally subordinated some details, as in the reduction of complexity in the arterial arcades of the mesentery. This is usually an advantage. The obturator nerve is represented as coming from the third and fourth lumbar nerves. Its usual origin from the second evidently did not exist in the subject from which the drawing was made. The left bronchus is represented as slightly larger than the right. On the whole the charts are unusually accurate, and excel in clearness, general scope and definiteness. In high schools and colleges they would be of very great interest and instructive value. Elementary physiology can hardly be intelligibly taught without some such help, and in laboratories of anatomy they are useful, especially on account of their wide scope, in correlating the structures in different regions of the body. Their admirable planning makes them a very effective means of instruction, and their artistic excellence and clearness will insure pleasure and satisfaction in their use.

ATLAS UND LEHRBUCH WICHTIGER TIERISCHER PARASITEN UND IHRER UEBERTRÄGER MIT BESONDERER BERÜCKSICHTIGUNG DER TROPENPATHOLOGIE. Von Dr. Med. et Phil. R. O. Neumann, o. ö. Professor der Hygiene und Direktor des hygienischen Instituts der Universität Bonn und Dr. Med. Martin Mayer, Abteilungsvorsteher am Institut für Schiffs- und Tropenkrankheiten in Hamburg. Cloth. Price 40 marks. Pp. 580 with 1382 illustrations. Munich: J. F. Lehmann, 1914.

The fine series of medical atlases published by Lehmann has received a notable addition in the volume by Neumann and Mayer on animal parasites and their hosts. The colored figures number more than thirteen hundred and there are numerous and excellent diagrams and text figures. The beautifully colored lithographic plates are likely to remain for a long time the high water mark for work of this sort. On some of them more than twenty colors have been employed to bring out the features desired. Considerably more than half of the text is devoted to the protozoa, and the remainder to the higher animal parasites. The work does not pretend to be exhaustive and is more complete as respects the parasites of man than the parasites of domestic animals. So far as possible the writers have tried not to neglect questions of interest to the professional zoologist, but the main purpose of the work has been to further the interests of practical medicine. The book is indispensable to every active worker in the field of animal parasitology.

NURSES FOR OUR NEIGHBORS. By Alfred Worcester, A.M., M.D., Chief of Maternity Service, Waltham Hospital. Cloth. Price $1.25 net. Pp. 267. Boston: Houghton Mifflin Company, 1914.

Dr. Worcester calls nursing "our common problem," and evidently does not consider that it has been solved, or that it is even near solution, by the establishment of the modern hospital training schools for nurses. He laments the lack of personal service in nursing and says that the old-fashioned custom of neighbor nursing neighbor had much to commend it. Nursing, he states, "essentially is caring for the helpless, whatever may be the cause or form of the helplessness, whether it be that of infancy, or of old age, or of accident, or of sickness; but hospitals admit only certain forms of human helplessness, and generally only the rarer forms." Again: "Experience in hospital nursing is, of course, an indispensable part of the perfect nurse's training, but it is by no means the whole of it. In our hospital training schools nurses acquire wonderful technical skill, and an extensive knowledge of diseases. They become adepts in distributing themselves and in managing many patients. As assistants of the hospital physicians and surgeon they learn much of the science, but little of the art, of medical practice; whereas nurses need to know only little of the science, but all that is knowable of the art of helping the helpless." The author speaks highly of the training given in the German deaconess institutions, in which hospital nursing is considered only as one of the departments or specialties of nursing and the young women are trained in district visiting and general home nursing. Many of Dr. Worcester's criticisms are well founded. The impersonal attitude toward patients required of nurses in hospitals is out of place in home nursing and is resented, and rightly, by the family of the patient. Too often a nurse's attempts to institute a hospital regimen in a home create irritation and discomfort among the relatives which is bound to react on the patient. Frequently, also, the nurse appears callous instead of sympathetic, and this the family naturally resents. Superintendents of hospitals throughout the country would do well to read this book and apply some of the suggestions in the training of their pupil nurses.

DISEASES OF CHILDREN. By Various Authors. Edited by Archibald E. Garrod, D.M., M.A., F.R.C.P., Physician to St. Bartholomew's Hospital, London, Frederick E. Batten, M.D., M.A., F.R.C.P., Physician to the Hospital for Sick Children, London, and Hugh Thursfield, D.M., M.A., F.R.C.P., Physician to Out-Patients, Hospital for Sick Children, London. Cloth. Price, $8.50 net. Pp. 1184, with 182 illustrations. New York: Longmans Green & Co., 1913.

This is the work of twenty-two leading British pediatrists, and the aim of the editors is "a comprehensive and authoritative account of the present state of our knowledge of the diseases of children, set forth with a completeness which they believe has not hitherto been attempted in this country." With Thompson, Still, Cautley, Poynton, Hutchison and others among the collaborators, the book is an expression of the most authoritative teaching on diseases of children in Great Britain to-day. We have had occasion before in reviewing the books of Thompson, of Still and of Cautley, to emphasize the fact that the British authors are keen observers and good clinicians, and this book corroborates that opinion. True they have been quite untouched by the important work that has been done in Germany, especially on nutrition and its disturbances, but this very isolation and aloofness that has laid them bare to the charge of "provincialism" has a certain value in that it gives one a different point of view. Judged from this aspect, the present volume contains a wealth of useful information to both student and practitioner, and takes its place beside that of Cautley, as one of the two most comprehensive and complete British text-books on diseases of children.

HYGIENISCHES PRAKTIKUM. Ein Taschenbuch für Studierende Aerzte und Kreisarztkandidaten. Von Dr. Med. Paul Uhlenhuth, geh. reg. rat und ordentl. Professor der Hygiene an der Universität Strassburg und Dr. Med. Hermann Dold, Privatdozent der Hygiene an der Universität Strassburg. Cloth. Price, $1.25. Pp. 272, with 90 illustrations. New York: Rebman Company, 1914.

This small book is intended as a laboratory supplement to lectures on hygiene. It covers such subjects as the hygiene of soil, water, food and drink, clothing, ventilation, light, etc. The object of the book is didactic and the methods are for the most part familiar. In connection with the microscopic examination of water it is not clear why organisms like Vorticella and Carchesium are figured while nothing is said about the algae and other micro-organisms sometimes responsible for offensive odors in water supplies. The bacterial examination of both water and milk is summarily dismissed. The discredited method of Eijkman for the detection of *Bacillus coli* is the only procedure mentioned. The methods given for the examination of meat, etc., are well described

and up to date. One chapter deals with the determination of the amount of alcohol in beer and wine. Altogether the book cannot be said to be particularly well adapted for use in this country, although it doubtless serves a useful purpose in its place of origin.

Die Wasserstoffionen-Konzentration, Ihre Bedeutung für die Biologie und die Methoden Ihrer Messung. Von Professor Dr. Leonor Michaelis, Privatdozent an der Universität Berlin. Paper. Price, 8 marks. Pp. 210, with 41 illustrations. Berlin: Julius Springer, 1914.

This is the first of a projected series of monographs on subjects in the general field of plant and animal physiology, modeled after the "Monographs on Biochemistry" series which has been such an important addition to biologic literature. Michaelis' work on hydrogen-ion concentration is an excellent illustration of the possibilities of this method of publication, and serves to render accessible an authoritative discussion of one of the most important of the recent advances in the application of fundamental principles of physical chemistry to biologic processes. The recognition that "reaction" means the proportion of hydrogen and hydroxyl ions in a solution, and nothing else, has done much to clear up many misconceptions in physiology, especially concerning the chemical conditions existing within the blood and tissues, and has been the direct stimulant of much progress in biologic and clinical chemistry. Michaelis has been one of the chief contributors to this field of research, and presents his highly technical subject with simplicity and clearness. It is not necessary to recommend this work to chemists and biologists; but we may emphasize the importance of the subject of "reaction" to physicians who desire to be informed concerning the basal advances in medical sciences, and the opportunity which this book offers them to learn its principles and applications.

Ambidexterity and Mental Culture. By H. Macnaughton-Jones, M.D., M.Ch., Q.U.I. Cloth. Price 75 cents net. Pp. 102, with illustrations. New York: Rebman Company, 1914.

The author of this little book, written for the laity, being thoroughly convinced that right-handedness and left-sided speech are acquired characteristics, advocates the teaching of ambidexterity in the lower-grade schools. He believes that the alternating or synchronous action of the dual sided brain, left and right sides equally cooperating with the associated arm and hand, and equally educated in their functional powers and uses, must have its psychophysical influence on the individual. To him that nation whose people are ambidextrous has a great advantage over others. Whether his expectations will be realized or will remain mere hopes, the teaching of ambidexterity must result in great benefit to a person who may develop aphasia and right-sided hemiplegia later in life. The book is well written and permeated by the positiveness of conviction.

Kirkes' Handbook of Physiology. By Charles Wilson Greene, A.M., Ph.D., Professor of Physiology, University of Missouri. Eighth American Revision. Cloth. Price, $3 net. Pp. 790, with 509 illustrations. New York: William Wood & Co., 1914.

This new edition of Kirkes' standard work retains the general form and features of previous issues. New material has been added in accordance with recent advances in our knowledge of internal secretions, and the author notes that an attempt is made to use as a determining pedagogic horizon not only physiology but also clinical medicine and surgery. A book of this character which has stood the test of time and reflects the best thought and criticism of some of our best physiologists is a worthy addition to any medical bookshelf.

Manual of Medical Jurisprudence, Toxicology and Public Health. By W. G. Aitchison Robertson, M.D., D.Sc., F.R.C.P.E., Lecturer on Medical Jurisprudence, School of Medicine, Royal College of Surgeons, Edinburgh. Cloth. Price, $2.50. Pp. 560. New York: Macmillan Company, 1913.

The passage of new public health laws in England since 1908—the date of issue of the first edition—and the rapid advance in the methods of mechanical filtration of water as well as the increasing demand for the book has led the author to prepare a second edition revised to date. While medical jurisprudence, public health administration laws of evidence and rules of procedure in England differ widely from those in the United States, yet the high standing and wide experience of the author will entitle his book to consideration by any one interested in public health anywhere. The second edition is larger and better illustrated than the first.

Studien über die Fortpflanzung von Bakterien, Spirillen und Spirochäten. Von Dr. Med. E. Meirowsky. Paper. Price, 12 marks. Pp. 95, with 11 illustrations. Berlin: Julius Springer, 1914.

This work of Meirowsky was planned with the idea of proving that Schaudinn's idea of the protozoal character of the *Spirochaeta pallida* was correct. Using the method of vital staining in his studies on the tubercle, lepra, paratyphoid and other bacilli, as well as on various types of spirochetes, which he cultivated, he was led to conclusions almost diametrically opposed to the assumptions on which he based his work. A discussion of the methods employed and of the details of Meirowsky's work cannot be taken up. Suffice it to say that he shows that the *Spirocheta pallida* is to be classed among the lower forms of plant life, probably in the group of mycelial types, and is in no way related to the animal forms, such as the protozoa. The subject matter is clearly written, the studies outlined being presented in a convincing manner. Many photomicrographs and drawings add to the value of the work.

A Text-Book of Pathology for Students of Medicine. By J. George Adami, M.A., M.D., F.R.S., Strathcona Professor of Pathology, McGill University, and John McCrae, M.D., M.R.C.P., Lecturer in Pathology, McGill University. Second Edition. Cloth. Price, $5 net. Pp. 878, with 408 illustrations. Philadelphia: Lea & Febiger, 1914.

In this edition of this standard text there has been added a new chapter on "The More Important Infections and Their Prominent Features." Other changes include an endeavor to simplify the classification of tumors which is a praiseworthy effort; the relegation of the chapter on "Monstrosities and Abnormalities" to an appendix, which is a good idea, and the addition of ninety-one engravings and two colored plates, making a total of 395 of the former and thirteen of the latter.

Die Moderne Therapie der Gonorrhöe beim Manne. Ein Leitfaden für Studierende und Aerzte. Von Prof. Dr. Paul Asch. Paper. Price, 2.60 marks. Pp. 84, with 25 illustrations. Bonn: A. Marcus and E. Webers, 1914.

Dr. Asch discusses in this pamphlet a subject on which much has already been written of both a valuable and a useless nature. Dr. Asch, however, takes nothing for granted and, beginning on the threshold, writes in detail from his own experience. He seems particularly partial to the Janet irrigation treatment, and believes that when instituted early and cautiously this method will prevent serious complications. There is a section on vaccine therapy and one on endoscopy which reflect modern opinions.

Manual of Diseases of the Eye for Students and Practitioners. By Charles H. May, M.D., Instructor in Ophthalmology, College of Physicians and Surgeons, Medical Department, Columbia University, New York. Eighth Edition. Cloth. Price, $2. Pp. 440, with 377 illustrations. New York: William Wood & Co., 1914.

The seventh edition of May's popular book appeared in August, 1911, and was reprinted August, 1913. This, the eighth edition, brings the work up to date. Its popularity is attested by eight English editions, two German, two Italian, three French, two Dutch, two Japanese, four Spanish and four for the British Isles.

Der Tierversuch in Psychiatrie und Neurologie. Akademische Antrittsvorlesung. Von Dr. Gabriel Steiner, Privatdozent in Strassburg im Els. Paper. Price 80 pfennig. Pp. 22. Wiesbaden: J. F. Bergmann, 1914.

In this lecture the author passes in review the various experimental methods in psychiatry and neurology as applied to animal psychology. The brochure gains in interest as many of the animal experiments, for instance those of Otto Kalischer, Pawlow and von Bechterew, can be applied to the elucidation of problems in human physiology and psychiatry.

Medicolegal

Physician as Committee of Lunatic

(Lake et al. vs. Hope (Va.), 82 S. E. R. 738)

The Supreme Court of Appeals of Virginia affirms a decree in favor of the defendant, a physician, whom it was sought to remove as committee of one Lake, a lunatic, on the ground of alleged incompetency and lack of care, together with unwarranted extravagance in managing his ward's estate, which was worth over a quarter of a millon dollars. When the defendant entered on his duties as committee his ward was a very sick man, suffering from alcoholic neuritis and some cerebral disorder due to the same cause. He was a helpless invalid—could not sit up in bed, could not lift a glass of water to his mouth, could not even turn over in bed without assistance. Mentally he was always in a state of dread, thinking that something was happening to him. Such was his serious illness up to June, 1910, when the plaintiffs complained to the court that the defendant had failed or refused to call in the services of a specialist on the disease or diseases with which Mr. Lake was afflicted. However, in the spring of 1912, Mr. Lake had improved so much under the defendant's care that he could walk wherever he pleased, while his mental condition was practically that of a sane person who could act for himself in the management of his affairs, unless subjected to great and unnecessary mental strain. The court thinks that the evidence justified the appointment and retention of the defendant as committee, and the allowance to him of $100 a month for his services as physician and for his care of his ward's estate.

One of the items of expense complained of was the purchase and upkeep of an automobile and a boat for the use of Mr. Lake. It appeared that Mr. Lake, before his illness, owned and enjoyed an automobile, which was practically his only source of outside pleasure. This machine gave out and the defendant disposed of it in exchange for a new one, which exchange involved an outlay in money in the sum of $1,150, and the upkeep of it and the boat for the year cost $350.27, making a total of $1,500.27. A son of Mr. Lake acted as chauffeur. For a man of Mr. Lake's worth, incapable of any other recreation or pastime, this item of expense for his comfort and pleasure could not be reasonably considered extravagant or wasteful. Nor was the reasonable expense of a trip of several months, taken by Mr. Lake to a winter resort in Florida, objectionable.

Giving Treatments by Manipulation and Adjustment a Practicing of Medicine

(Harvey vs. State (Neb.), 148 N. W. R. 924)

The Supreme Court of Nebraska affirms a conviction of the defendant on eight counts, each of which contained this allegation: "Did then and there for remuneration unlawfully practice medicine by unlawfully treating and attempting to heal one (name of patient) for a bodily ailment through the manipulation and adjustment with the hands by the said Earle A. Harvey, of certain nerves, bones and tissues of the body of the said (name of patient) without first having issued to him, the said Earle A. Harvey, by the said State Board of Health of the state of Nebraska, a certificate or license to practice medicine." The court says that the information without doubt charged offenses under Sections 2717, 2723, and 2724 of the Revised Statutes of Nebraska of 1913.

To "operate on, profess to heal or prescribe for, or otherwise treat any physical or mental ailment of another," is "practicing medicine" by the express provision of Section 2724. It is unlawful in Nebraska to treat professionally and attempt to heal another by manipulation and adjustment of nerves, bones and tissues of the body without first obtaining a certificate or license from the State Board of Health, as provided in Articles 2 and 8, Chapter 27, of the Revised Statutes of 1913. Every such treatment constitutes a separate offense, although of the same individual and for the same physical or mental ailment, if such treatments are on different days and entirely independent of each other. So, although three counts in the information charged treatment of the same individual, but these treatments were on different days, and not dependent on each other, each was a violation of the law.

Much was said in the brief about the "liberty of the citizens to follow a profession" and to "pursue a lawful calling in a lawful manner." It was said that the state cannot "prohibit any calling or profession, save and except it be detrimental to the public welfare, public morals, public health, or a disturbance of the public peace. The state may not indirectly prohibit what it cannot prohibit directly, i. e., it may not prohibit the exercise and practice of chiropractic by refusing to provide an examination in the curriculum taught in the best schools and colleges of chiropractic—those branches deemed essential and put in operation by leading chiropractors—and compelling the chiropractor to procure a diploma from a medical college and take an examination in the curriculum of some of the sects of drug medication." But this court cannot amend the statutes, nor disregard the early decisions upholding and construing those statutes. The legislature has had ample opportunity to modify the laws, if they are considered harsh, unjust, or impolitic, and, not having done so, they must be enforced as the will of the public expressed through its lawmaking powers. All objections raised in the brief are answered by the plain provisions of the statute, as construed by early decisions of this court. The case of State vs. Buswell, 40 Neb. 158, involved what is called Christian Science healing, and was determined more than twenty years ago, upholding the statute. Little vs. State, 60 Neb. 749, involving the practice of osteopathy, was decided about fourteen years ago, and also upholds the statute.

Corporations Not Bound for Attendance on Injured Employees

(Journal & Tribune Co. vs. Lones (Tenn.), 169 S. W. R. 760)

The Supreme Court of Tennessee says that the company was sued by Dr. Lones for attendance on an employee who had his hand crushed while engaged in the line of duty in the company's pressroom. The injury was received at a late hour at night, when all officers, including the general manager and the assistant general manager, were absent from the publishing plant. The night editor was the highest agent of the company on duty, and, on being notified of the employee's condition, called Dr. Lones over the telephone to attend him. With regard to the first aid treatment, no question was made, the company having admitted responsibility therefor. The contest was over that portion of the physician's bill which represented subsequent visits to the injured man at a hospital to which he was removed, and for office treatment of him. Without determining just what the authority of the night editor was, in the absence of the general manager and his assistant, the court holds that a judgment rendered in favor of the physician, against the company, was properly reversed. It says that the rule is that even the general manager of a commercial corporation has no authority or power implied from his official position to commit his company to the payment of ordinary attendance (as contradistinguished from emergency attendance) by a physician or surgeon on an employee of the corporation, injured while in the line of duty.

Duty to Minimize Damages in Cases of Traumatic Neurasthenia

(Mickelson vs. Fischer et ux. (Wash.), 142 Pac. R. 1160)

The Supreme Court of Washington says that there is a duty, resting on every one who seeks to recover damages, to minimize the amount to be measured in dollars and cents. An allowance of damages in cases of traumatic neurasthenia touches the border of speculation at best, and it is manifestly unfair for one who seeks to recovery of damages to put a defendant to the hazard of a further speculation by refusing the aids which science affords and which are available, or by postponing the time of treatment until after a trial and a verdict.

Society Proceedings

COMING MEETINGS

American Association of Anatomists, St. Louis, Dec. 28-30.
American Physiological Society, St. Louis, Dec. 27-30.
Amer. Public Health Association, Jacksonville, Fla., Nov. 30-Dec. 5.
Society of American Bacteriologists, Philadelphia, Dec. 29-31.
Southern Surgical and Gynecological Assn., Asheville, N. C., Dec. 15-17.
Western Surgical Association, Denver, Dec. 18-19.

SOUTHERN MEDICAL ASSOCIATION

Eighth Annual meeting, held at Richmond, Va., Nov. 9-12, 1914

The President, Dr. Stuart McGuire, Richmond, in the Chair

Early Diagnosis of Pulmonary Tuberculosis

Dr. Charles H. Cocke, Asheville, N. C.: I cannot too strongly urge the value and necessity of careful history taking with the expectation of finding some contact infection. For the examination the patient must be stripped to the waist. No examination is complete without careful inspection of the throat with a laryngeal mirror. The Roentgen ray is also invaluable. Of the tuberculin tests, the subcutaneous is the test *par excellence* where there is no fever, a focal reaction bespeaking active disease, while a febrile reaction alone, unless obtained with the initial small dose, implies a high tuberculin sensitiveness and consequently almost certain probability of active tuberculosis.

Significance of the von Pirquet Test

Dr. Thompson Frazer, Asheville, N. C.: A positive cutaneous reaction is less frequent in children than it was once thought to be. The view usually held, that the reaction has significance only during the first two or three years of life, is not borne out by recent figures, and we should be suspicious of a reaction occurring up to the age of 10. Annual tests should be instituted in the effort to detect early infection. A negative reaction, negative on the repetition of the test, is valuable evidence of the absence of tuberculosis unless the child is suffering from advanced disease or acute disease, especially measles.

State Policy in the Management of Tuberculosis

Dr. W. S. Rankin, Raleigh, N. C.: The combination of cooperative sanatorium and correspondence school is of mutual advantage, the one developing the other. The combination gives the state an educational organization analogous to the ideal system of education in operation in Wisconsin. Our cooperative sanatorium in this system is the central university where about one-tenth of the consumptive population is treated and is taught what constitutes the right kind of treatment for consumption. These alumni, on returning home and seeing other cases not being properly treated, enable the sanatorium to improve the medical supervision of consumptives throughout the state. The correspondence school, an adjunct of the central university or sanatorium, puts the state government in almost personal touch with its entire tuberculous population.

The Federal Government and Our Tuberculosis Problem

Mr. G. M. Cooper, Clinton, N. C.: The national government should form a cabinet office of secretary of the public health, to rank with the army and agricultural departments; then let the national Public Health Service, through each state board of health, invite any county that desires to cooperate with it in the work. Those who agree are to pay one-third of the expense incidental to maintenance of a whole-time, efficient health officer. The state board of health is to pay one-third, and the national government the remaining third. Under this plan the local county government would select the officer, subject to approval by the state and national health authorities. In this manner local self-government would continue to exist and the health officer would have the mail franking privileges, so that he could reach all classes of citizens. Open-air schools and tent colonies in each county would be established, and each county would be the center of a public health school in which preventive medicine would be taught.

President's Address: The Profit and Loss Account of Modern Medicine

Dr. Stuart McGuire, Richmond, Va.: The most distinct profit and loss in modern medicine has come about through changes in medical education, which have been accomplished largely through the effort of the American Medical Association, the Association of American Medical Colleges and the Carnegie Foundation for the Advancement of Teaching. It was recognized that each year a progressively increasing number of low-grade practitioners were being graduated by medical colleges and licensed by state governments. An investigation of the medical schools showed that many of them were poorly equipped, had scant clinical material and lacked sufficient funds to procure the necessary time of efficient teachers. To remedy this evil a deliberate and systematic movement was inaugurated to lessen the number and improve the quality of the men who were being added to the ranks of the profession. By moral suasion, by state legislation and by the combination of the better schools, the entrance requirements were advanced, the number and length of the teaching sessions were increased, the character and scope of the curricula were improved, and the minimum number and approximate pay of the full-time teachers were specified.

While the profit side of the specialist's account is large, still on the opposite page we find some items of loss. The high esteem in which the specialist is held, the pecuniary rewards which his services command and the advertising opportunities offered by his position have made him a victim of imitators and imposters, who deceive and defraud the public. Modern medicine is not responsible for the quack and charlatan, but it is responsible for the members of the regular profession found in every town and city who claim to be specialists, but who really do a general practice, and for others who, while they may limit their work to certain diseases, are not qualified as experts and have no more knowledge or experience in their diagnosis and treatment than the average general practitioner.

Pleural Effusions of Artificial Pneumothorax

Dr. Mary E. Lapham, Highlands, N. C.: Our five years' experience with artificial pneumothorax has led us to believe that the tendency to pleural effusions increases with the length of time the compression is maintained. We have had three types of pleural effusions, those developing without any clinical manifestations and no suggestions of any active process. The fluid may be first detected by the rise in pressure in the manometer, or by filling the needle, or be heard as a splashing sound by the patient. We call these myocardial effusions. A second class has developed in consequence of repeated traumatisms of the pleura as a result of an acute infection, such as an angina, or of chilling, or from other reasons commonly associated with ordinary pleurisies. We call these infectious pleurisies. A third class is due to tuberculous nodules and process in the pleural surfaces and these seem to have been favored by the separation of the pleural surfaces by the artificial pneumothorax.

DISCUSSION

Dr. W. S. Leathers, University, Miss.: There is no problem in public health that has more aspects than that of tuberculosis. There is no problem that has more difficulties associated with its solution. The best plan of attacking the tuberculosis problem is on a cooperative basis.

Dr. C. W. Stiles, Wilmington, N. C.: I take issue with the idea that the federal government is doing very little in regard to this problem. Every pound of meat that comes into a state has been inspected by the Department of Agriculture for tuberculosis. The federal government is carrying out certain restrictive measures in interstate commerce according to the law, which is no small contribution to the fight against tuberculosis. Unless the medical profession is willing to set an example by controlling its own members with regard to spitting, etc., it is foolish for us to go to the

federal government and ask the state to change the Constitution of the United States in order to put local police power into the hands of the federal government.

DR. CHARLES L. MINOR, Asheville: The von Pirquet test has been misused. I have had cases of full-grown adults sent to me on account of a positive von Pirquet. We must not reach the conclusion that because every case reacts to this test, it is necessarily active tuberculosis. We must differentiate between latent and active tuberculosis; otherwise there will be great harm done.

DR. THOMPSON FRAZER, Asheville: The reason we fail to detect tuberculosis early is that we do not recognize it as a chronic disease with relapses.

DR. W. L. DUNN, Asheville: A firm conviction on the part of the physician is necessary to impress a patient that he is ill with tuberculosis. The average physician is afraid to make an early diagnosis of tuberculosis and say so firmly to the patient, because he is afraid the patient will be unnecessarily treated or his activities will be interrupted.

DR. E. C. THRASH, Atlanta: Many practitioners have made a diagnosis of tuberculosis from the fact that they obtained a reaction, and the result was that it would throw a well person into a panic and perhaps subject him to many inconveniences, possibly a trip away, while other persons subjected to the tests would have the disease. I have seen cases of far-advanced tuberculosis in which physicians said they did not have tuberculosis because the von Pirquet or tuberculin test proved negative.

DR. WILLIAM R. KIRK, Hendersonville, N. C.: We should not attach too much importance to the temperature curve alone, for very often we get the same curve in cases of malignant disease.

DR. D. M. MALLOY, Mobile: In New South Wales it is obligatory on every physician to report every case of tuberculosis. The law is stringent on this point, and carries with it a severe penalty in the way of a fine, and possibly imprisonment. The reporting of each case also carries with it a reward of five dollars.

(To be continued)

MEDICAL SOCIETY OF VIRGINIA

Annual Meeting held in Washington, D. C., Oct. 27-30, 1914

(Concluded from page 1978)

Trachoma

DR. TALIAFERRO CLARK, Washington, D. C.: Trachoma is protean in its manifestations. In the mucous membrane the lymphoid cells are stimulated and undergo enormous proliferation. There are pannus, granulations and the formation of scar tissue. The color depends on the vascularity. It requires an abrasion of the mucous membrane and moisture, and hence occurs most frequently in those living under bad hygienic surroundings. It constitutes a grave social and economic problem. From 1899 to 1901, 8.5 per thousand of all eye infections were due to this. Eighteen per cent. of all blindness in Russia is due to it. One thousand cases a year are treated in the Lemberg Hospital. In Posen and Silesia it is very prevalent. In Japan, of 400,000 recruits, 23 per cent. had trachoma. It is a world-wide disease. All seeking entrance to America are examined for trachoma. Twenty-two and seven-tenths per cent. of western Indians and 13 per cent. of Indians in Virginia have it. Only nineteen cases in negroes were found in a thousand examinations. The negro has been protected in the past only by his lack of opportunity to contract it.

Trachoma: Methods Adopted for Its Control in Eastern Kentucky

DR. JOHN MCMULLEN, Washington, D. C.: In 4,000 eye examinations in Kentucky, 12 per cent. were found to have this disease. On some of the creeks, 75 per cent. of families had it. No class were exempt. Untreated it lasts a lifetime. The large family towel is a source of danger, and the lack of good light in the houses contributes. Prevention is synonymous with education. Teachers' institutes and church organizations have been enlisted. Parents and teachers had copies of popular pamphlets mailed to them. House-to-house visits were made and instruction given. District nurses are employed. Surgical treatment under a general anesthetic must be used for young children, and the period of treatment immediately following is very important. Three hospitals have been established, of fifteen beds each. Two of these are 20 miles from a railroad. They are kept scrupulously clean as an object lesson. Patients are given separate toilet articles. There is a dispensary connected with each. The first was opened in September, 1913, and the last in March, 1914. Over ten thousand cases have been treated. The average daily total cost of each hospital is $17.30. Gratifying and encouraging results have followed. Many who were formerly paupers have been made self-supporting. Trachoma should be a reportable disease in every state.

DISCUSSION

DR. JOSEPH A. WHITE, Richmond: Fortunately we are free from trachoma in the cities. I recently wrote to all the oculists in the state; very few had had any experience with this disease. In my experience of over thirty years in Richmond, I have seen not more than four or five cases. We are almost as much in the dark as to the treatment as to the cause. An effort to prevent corneal complications is important to prevent blindness.

DR. C. R. DUFOUR, Washington, D. C.: Hospital work is the only way to eradicate this disease. It behooves the government to establish hospitals. Some in any given family seem to be immune. I think treatment should be made compulsory, as many accept it as a visitation of the Almighty and make no effort to get cured.

DR. C. M. MILLER, Richmond: I have seen but four cases in fourteen years, but we are confronted by this menace. The negro is not immune. The conditions under which he lives are horrible, and if it gets a start it will spread rapidly. The board of health should take a hand in this work.

DR. W. E. DRIVER, Norfolk: At Hampton Normal School I had recorded 30 per cent. of Indians as having trachoma, but it was different from that which I have seen abroad; I think many of them are cases of tuberculosis. I have never seen a case in a negro, though in that school the whites and negroes are intimately associated.

DR. TALIAFERRO CLARK, Washington, D. C.: Tuberculosis is a destructive disease, while trachoma has new tissue building. In examining probably one million eyes, I have seen only one case of tuberculosis.

DR. JOSEPH A. WHITE, Richmond: I have encountered opposition from the oculists in the matter of public lectures on the eye, because they say they would be accused of advertising themselves. This method has the approval of the American Medical Association.

DR. E. G. WILLIAMS, Richmond: We of the state health department have not been unmindful of this menace, but have tried to attack our problems at the point where the greatest need appears. The typhoid problem is the most pressing. We recently issued 50,000 copies of a bulletin on defective hygiene, and defective eyes are treated of in this.

Acidity, Alkalinity and Anesthesia

DR. GEORGE W. CRILE, Cleveland: Acidity of the blood is increased by muscular effort, emotional disturbances, surgical shock, infections, asphyxia, inhalation anesthetics, and excision of liver and kidneys. Ether, nitrous oxid and alcohol produce acidity. A certain degree of acidity is incompatible with life. At the point of death the blood is always acid. May not the acidity be the actual cause of death? I think it is. If epinephrin in sufficient quantity be injected the acidity is controlled. Acidosis results from starvation, diabetes and Bright's disease. The acidity of the blood is increased in two seconds after the beginning of nitrous oxid anesthesia. Acid inhibits the action of the cerebral cortex, but stimulates that of the medulla.

DISCUSSION

DR. W. P. CARR, Washington, D. C.: The old physiologists said alkaline blood was necessary to carry off the carbon

dioxid. This is a new and rather startling theory—acidity the cause of anesthesia. We have not yet grasped the importance of anoci impulses which reach the brain. The field opened up by this paper is enormous; we must have time to digest it. We can get this lesson at least, to make anesthesias as short and as light as possible, and use anoci methods.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

Albany (N. Y.) Medical Annals

November, XXXV, No. 11, pp. 575-638

1 Sex Hygiene. H. L. K. Shaw, Albany.
2 Sex Education in Schools. I. S. Wile, New York.
3 Question of Sex Education. C. P. McCord, Albany.
4 Public Instruction in Sex Hygiene. W. F. Snow, Sacramento, Cal.
5 Sex Question from Woman's Standpoint. R. S. Morton, New York.
6 Albany Hospital: Twelfth Report of Pavilion F, Department for Mental Diseases for Year Ending September 30, 1914. J. M. Mosher, Albany.

American Journal of Obstetrics and Diseases of Women and Children, York, Pa.

November, LXX, No. 5, pp. 689-864

7 *Necessity of Constantly Looking for Cancer of Uterus. J. H. Carstens, Detroit.
8 *Abdominal Distention Following Operations on Pelvic Viscera. F. Reder, St. Louis.
9 *End-Results After Operation in One Hundred and Nine Cases of Displacement of Uterus, Bladder and Rectum. H. A. Wade, Brooklyn.
10 *Renal Damage from Calculi. H. D. Furniss, New York.
11 *Myomectomy with Extensive Resection of Uterus in Fibroid Tumors. X. O. Werder, Pittsburgh.
12 *Two Cases of Cancer of Uterus Apparently Cured by Postoperative Infection. J. W. Poucher, Poughkeepsie, N. Y.
13 Factors Determining Morbidity of Surgical Cases. C. W. Moots, Toledo.
14 Mineral Springs of Saratoga. D. C. Moriarta, Saratoga Springs, New York.
15 *Technic of Intestinal Anastomosis, with Special Reference to Modification of Maunsell's Method. F. D. Gray, Jersey City, New Jersey.
16 *Delayed Union in Non-Infected Epigastric Wounds. M. F. Porter, Fort Wayne, Ind.
17 Ruptured Gastric and Duodenal Ulcer. E. A. Vander Veer, Albany, N. Y.
18 Biliary Surgery. J. F. Erdmann, New York.
19 *Anastomosis of Gall-Bladder to Stomach: "Cholecystogastrostomy." J. H. Jacobson, Toledo.

7 and 10. Abstracted in The Journal, Oct. 10, 1914, p. 1319.

8, 11 and 12. Abstracted in The Journal, Oct. 17, 1914, p. 1418.

9. **End-Results After Operation of Displacement of Uterus, Bladder and Rectum.**—The body of the uterus was replaced to its proper position in the pelvis by the abdominal route combined with some sort of vaginal repair in sixty-one cases. Of the 109 cases investigated by Wade, twenty-four were made by plication of the round and broad ligaments on the upper and anterior surface of the body of the uterus, according to the method of Coffey, combined with some form of repair of the cervix or of the vagina. The operation has been fairly satisfactory. In twenty-one cases the patient has had a restoration of the pelvic viscera to their proper position, and in twenty of the cases the patients felt an improvement after the operation. Five became pregnant subsequently; one miscarried at the twenty-fourth week of her pregnancy; four went to term and were delivered vaginally of living children.

The uterus was suspended by plication of the round and broad ligaments without the aid of vaginal surgery in three cases. The uterus was movable and in place in two cases, and in two cases the patients felt improved after the operation. One became pregnant subsequently, carried her pregnancy to the twelfth week, and then aborted. The uterus was suspended from the anterior abdominal wall with No. 2 chromic catgut combined with some form of vaginal repair in thirty-three cases. The uterus remained in its proper position in twenty-three cases. In twenty of the cases the patient felt some improvement after the operation; nine women became pregnant and eight were delivered of living babies; one died. The uterus was suspended from the anterior abdominal wall without repair of the vaginal tract in seven cases. One became pregnant; three felt better after the operation, and in five cases the uterus was in place and appeared to be movable.

Four cases of the Baldy or Webster method suspensions combined with a repair of the vaginal canal were investigated. Two of the patients showed the uterus movable and well placed, and two felt some improvement after the operation. None of the patients had become pregnant. The vaginal method of supporting the uterus, and with it the bladder and rectum combined with the suspension from above, has been satisfactory to the patient in forty-two of the sixty-one cases examined. The uterus has remained in position and has been movable in fifty of the cases; fourteen of the patients became pregnant; two aborted; ten had normal deliveries, and two were delivered by the aid of forceps. Thirty-six of the patients had had the uterus supported by repair of the posterior vaginal wall without suspension; twenty-eight of these women felt improved after the operation, and in thirty cases the uterus was movable and in good position. The prolapse of the rectum was relieved in ten of the cases examined. The bladder in fifteen cases, in which it was involved in the procidentia, was placed in its proper position in the pelvis in nine cases. Eight of these women became pregnant after the operation. The mobility of the uterus has never been interfered with when replacement was affected by support from below, and flexions of the body on the cervix have not resulted from the operation. One death occurred which was probably due to cardiac embolism.

15. **Technic of Intestinal Anastomosis.**—Gray substitutes a continuous locking suture for the interrupted sutures used by Maunsell. The suture begins at the approximated mesenteric borders in the form of a circular stitch enclosing all four mesenteric leaves, the tail of the suture being left sufficiently long to tie to the other end on its return. The suture is then carried rapidly around the aperture of anastomosis, the stitches, penetrating ⅛ to 1/16 of an inch below the free borders and placed about that distance apart, locked at each thrust by passing the needle under the loop before drawing it home, which should be done under considerable tension. The final tie leaves a single knot that of necessity lies within the bowel.

16 and 19. Abstracted in The Journal, Oct. 10, 1914, p. 1320.

American Journal of Physiology, Baltimore

November, XXXV, No. 4, pp. 367-495

20 Acoustic Reflexes in Decerebrate Cat. A Forbes and C. S. Sherrington, Boston.
21 *Faradic Stimuli: Physical and Physiologic Study. J. Erlanger and W. E. Garrey, St. Louis.
22 *Prothrombin. W. H. Howell, Baltimore.
23 *Coagulation of Lymph. W. H. Howell, Baltimore.

21. **Faradic Stimuli.**—Erlanger and Garrey report in detail the results of a study of the shocks yielded by induction coils of the types commonly used in the laboratory, with a view to the determination of their configuration in relation to their efficiency as stimuli under conditions commonly obtaining in physiologic investigations. The deficiencies of the string galvanometer as an indicator of currents of such short duration as induction shocks are discussed, and a rheotome method (the gap method) of making it possible to conveniently determine qualitatively and quantitatively the configuration of shocks with the string galvanometer, is described. A platinum contact key for make shocks is also described.

22. **Prothrombin.**—Howell found prothrombin may be precipitated by acetone from oxalated blood-plasma and be obtained in solution free from the other fibrin factors, with the possible exception of traces of antithrombin. The prothrombin is converted to active thrombin in the presence of calcium salts. No third factor seems to be necessary for

this activating process. The activating property of calcium salts is exhibited to a much less extent by strontium salts, and very feebly by magnesium salts. The prothrombin in salt-free or salt-poor solutions is weakened but not destroyed by heating to 60 C. Aqueous extracts of the blood-platelets show the presence of both prothrombin and thromboplastin. Prothrombin (probably some thromboplastin also) is contained in the plasma of circulating blood. In shed blood disintegration of the platelets furnishes an additional supply of prothrombin and thromboplastin.

23. **Coagulation of Lymph.**—The lymph used by Howell in his experiments was obtained from dogs by placing a cannula, vaselined along its inner surface, into the thoracic duct. The animals were anesthetized with morphin and ether. The flow from the cannula was variable, but in fed animals with a milky lymph was quite abundant, averaging about 0.5 c.c. to a minute. He found that the coagulation-time of lymph varies greatly. In well-fed animals with much chyle-fat in the lymph coagulation is slower than in the clear lymph from fasting animals, but the addition of thromboplastic material (tissue-extract or kephalin solutions) causes the lymph to clot promptly and firmly. Lymph plasma contains antithrombin in the same concentration as in blood-plasma. When freed from corpuscles by long centrifugalization the lymph plasma clots with great slowness, owing to a relative excess of antithrombin. Addition of kephalin solution to such plasmas causes prompt clotting. The thromboplastin in solution in lymph-plasma is less in amount than in the blood-plasma. In shed lymph a new supply of thromboplastin is furnished by the lymphocytes, but more slowly than in the case of the blood in which the additional thromboplastin is derived from the unstable platelets. Prothrombin is present in solution in the circulating lymph. Its activation to thrombin by calcium is retarded or prevented by the relative excess of antithrombin.

Archives of Internal Medicine, Chicago

November, XIV, No. 5, pp. 609-768

24 *Pulse-Flow in Brachial Artery. A. W. Hewlett, Ann Arbor, Mich.
25 *Total Non-Protein Nitrogen and Urea of Blood in Health and in Disease, as Estimated by Folin's Methods. W. Tileston and C. W. Comfort, Jr., New Haven, Conn.
26 *Epidemic of Streptococcus Sore Throat in Jacksonville, Ill. Traced to Milk of Cows Affected with Streptococcus Mastitis. J. A. Capps and D. J. Davis, Chicago.
27 Specific Hyperleukocytosis. F. P. Gay and E. J. Claypole, Berkeley, Cal.
28 *Experimental Study of Methods of Prophylactic Immunization Against Typhoid. F. P. Gay and E. J. Claypole, Berkeley, Cal.
29 Case of Diabetes Insipidus. R. Fitz, Boston.
30 *Experimental Pathology of Stomach. W. W. Hamburger and J. C. Friedman, Chicago.
31 *Clinical and Bacteriologic Study of Hexamethylenamin as Urinary Antiseptic. L. H. Levy and A. Strauss, New York.
32 *Blood-Platelets and Tuberculosis. G. B. Webb, G. B. Gilbert and L. C. Havens, Colorado Springs, Colo.
33 *Pulmonary Physical Signs and Roentgen-Ray Findings in Healthy Adults. L. Hamman and F. H. Baetjer, Baltimore.

24. **Pulse-Flow in Brachial Artery.**—In febrile patients showing palpable types of the dicrotic pulse, Hewlett found that the brachial flow curves show characteristic changes. These consist in a marked backflow in the brachial artery just after the entrance of the primary pulse-wave and in an inflow and outflow with the dicrotic wave. In the form of pulse described as monocrotic there is also a marked outflow just after the primary pulse-wave, but no marked dicrotic wave follows. This type of pulse is closely related to the typical dicrotic pulse. The primary wave in each has a pointed character. Other things being equal, the pointed character of the pulse in the arm is increased by vasoconstriction of the arm arterioles and is diminished by their relaxation. In many, if not in all cases, factors outside of the arm play a part in the production of the jointed pulse. Among such possible factors are (1) a brief systolic output from the heart and (2) a dilatation of certain vascular areas outside of the arm, the most important being the splanchnic vessels.

25. **Non-Protein Nitrogen and Urea of Blood in Health and Disease.**—Analyses of the blood for total non-protein nitrogen and urea nitrogen were made by Tileston and Comfort by the methods of Folin in five healthy adults and 142 hospital cases. In the fasting healthy adult the total non-protein nitrogen varied between 22.9 and 25 mg. per 100 c.c. of blood, and the urea nitrogen between 12 and 14 mg. The effect of a full meal with meat in the case of the healthy adult was a rise of total non-protein nitrogen averaging 4.7 mg., and of urea, averaging 2.5 mg. In both chronic interstitial and chronic diffuse nephritis the cases without symptoms of uremia showed normal or moderately elevated values; the uremic cases, with one possible exception, showed a great increase in both nitrogen and urea. The excretion of phenolsulphonephthalein was roughly proportionate to the degree of retention; the cases with 100 mg. or over of total nitrogen all showed 5 per cent. or less phenolsulphonephthalein excretion. Many cases, however, with a considerable impairment of phenolsulphonephthalein excretion showed no signs of retention, and a moderate amount of retention of waste nitrogen often occurred with no impairment of the elimination of phthalein. The proportion of urea nitrogen to the total non-protein nitrogen in disease varied from 32 to 85 per cent. Where the nitrogen was normal the urea usually was about one-half the total nitrogen; where it was elevated, the urea usually but by no means always constituted about 70 per cent. of the whole. No reason could be found for these variations. The determination of the total non-protein nitrogen alone is therefore more valuable than that of the urea alone. The determination of the total non-protein nitrogen is a great aid in the prognosis of chronic nephritis. Patients showing over 100 mg., with one exception, did not live more than thirty-five days.

The results of blood analysis furnish the best guide as to the diet to be given in nephritis; cases with a considerable retention require a restriction of the protein, and by this means a return to normal figures may be brought about, if the azotemia is not too pronounced. In cases of outspoken uremia, however, no marked reduction of the azotemia has resulted from a protein-poor diet. Nephritis with a normal amount of non-protein nitrogen does not call for any marked decrease of protein in the diet. Many other lesions were investigated in this connection. For the results obtained in these cases the original article should be consulted.

26. **Epidemic of Sore Throat Traced to Milk of Cows.**—There were 348 cases of sore throat in the series investigated by Capps and Davis, most of them complicated by enlargement of the cervical glands and many by a marked exudate. Cultures from a number of throats showed a hemolytic streptococcus. In a canvass of 913 households, in 60 per cent. of the cases of sore throats, milk or cream from Dairy X was used, although this dairy supplied only 17.5 per cent. of the households. The morbidity rate in one institution supplied by Dairy X was 40 per cent.; in four other institutions supplied by other dairies it averaged 1.7 per cent. Among 1,000 customers of Dairy X, 215, or 21.5 per cent., developed sore throat, whereas among 6,416 customers of other dairies, 133, or 2.1 per cent., developed the disease. As a result of a systematic inspection of 416 cows on thirty-eight dairy farms, eleven cows with garget were found. Bacteriologic examinations revealed hemolytic streptococci in the milk of two of these diseased cows. The milk of both of these cows was distributed by Dairy X. As Dairy X did not pasteurize the cream at all and the milk very inadequately, Capps and Davis conclude that the streptococci originating in the bovine mastitis were probably responsible for the epidemic. Because of the extensive distribution of ice cream, manufactured from the Dairy X cream, they suspect that ice cream played an important rôle as a carrier in this epidemic.

28. **Methods of Prophylactic Immunization Against Typhoid.**—The history of the development of artificial immunization against the typhoid bacillus in animals and human beings is reviewed by Gay and Claypole, and some of the many preparations of the typhoid bacillus used for this purpose are discussed. Particular attention is drawn to the reputed advantages of living sensitized typhoid vaccine (Besredka) as opposed to other types of vaccine. The many vaccines that are still being advocated indicate that the best vaccine

has not yet been found and that the best method of proving which is the best vaccine has not been determined. Sensitized cultures of the typhoid bacillus, whether whole or as sediment, produce little or no reaction in human beings with the possible exception of those who have previously suffered from typhoid or have been immunized. By comparing their results with those of certain other observers, the authors conclude that a considerable degree of reaction, both local and general, is avoided by the use of these sensitized cultures, which possess the further advantage, so far as their experimental work can determine, of producing a more durable type of immunity.

The authors recommend vaccination at short intervals (two days) in human beings, which is rendered quite possible with the mild vaccine they employ, and is evidenced from animal experimentation, as giving rise to less toxic effect and to fully as durable an immunity as vaccination at longer intervals. This type of vaccination has the further advantage of completing the prophylactic treatment of three injections within a week. They further believe that a polyvalent vaccine derived from strains of the typhoid bacillus isolated in the vicinity of patients who are to be treated is advantageous, judging largely from the work of other observers. A further advantage in the use of sensitized cultures is that a polyvalent vaccine, no matter how recently the strains may have been isolated, is also almost entirely free from untoward effect. They recommend for prophylactic immunization against typhoid, three injections of the sediment of a dried, ground, sensitized culture of several local strains of the typhoid bacillus mixed together, given at two-day intervals and in a dosage of 3/12 mg. of the original dried culture, which corresponds, as has been determined, to a dosage of approximately 750 million living typhoid bacilli.

30. **Experimental Pathology of Stomach.**—Hamburger and Friedman found that moderate pyloric stenosis in dogs (ligature around pylorus tied loosely) causes little or no change in stomach motility, acidity or size. Marked obstruction (ligature tied sufficiently tight to produce marked peristalsis and anemia of the pylorus) causes motor insufficiency, continuous secretion (hyperacidity) and hypertrophy and dilatation of the stomach. Complete occlusion (ligature or silver nitrate injection causing secondary occluding edema) results in inanition, vomiting, convulsions (gastric tetany) and death of the animal in from forty-eight to 120 hours. The pyloric ligature (stenosis) results in a motor insufficiency with food retention which in turn sets up a continuous secretion with the constant presence of free hydrochloric acid. Pyloric obstruction with resulting motor insufficiency and continuous secretion are probably the most important factors in the production of chronic experimental ulcer. While the foregoing results concern experimental chronic ulcer, the authors conclude that it is more than likely that primary partial pyloric stenosis (from whatever cause) with secondary motor insufficiency and continuous secretion are largely responsible for the progression and delayed healing of chronic ulcer in man.

31. **Hexamethylenamin as Urinary Antiseptic.**—The urines from 91 patients were examined by Levy and Strauss. The greater number of these patients received 7 gm. of hexamethylenamin three times a day. Most of the urines were examined twice and some of them as many as six times. About 250 urines were examined. The 91 cases may be divided as follows: surgical 42, medical 32, genito-urinary 17. The urines of all of the 91 patients gave a test for formaldehyd varying from 1:20,000 to 1:5,000. The urines from 72 patients showed the presence of formaldehyd in the strength of 1:10,000. The colon bacillus was the most common invader of the urinary tract, occurring in 64 per cent. of the cases. To be of real therapeutic value, the hexamethylenamin or its derivative would have to be excreted in a concentration strong enough to be either inhibitory or bactericidal. The action of a 10 per cent. solution of hexamethylenamin was tried on various organisms.

The authors found that formaldehyd to be of value must be liberated in strengths varying from 1:15,000 to 1:5,000, depending on the organism the growth of which is to be inhibited. To be of bactericidal value it must be liberated in strengths from 1:5,000 to 1:1,000, also depending on the organism. For the destruction or inhibition of growth of organisms other than the typhoid bacillus a high acidity is necessary. This high acidity in combination with the formaldehyd may produce injury to the kidney tissue. Hexamethylenamin, therefore, appears most efficacious as a prophylactic during the course of typhoid for the prevention of a pyelitis or cystitis.

32. **Blood-Platelets and Tuberculosis.**—Blood-platelets are consistently increased in the tuberculosis of man and guinea-pigs. At an altitude of 6,000 feet, blood-platelets are increased in the circulating blood of man and guinea-pigs. Blood-platelets would appear either to contain or to supply opsonin. Blood-platelets added to a lethal dose of tubercle bacilli appear to modify the course of infection or to prevent it. The addition of serum to a mixture of blood-platelets and tubercle bacilli appears to interfere with this modification.

33. **Pulmonary Physical Signs and Roentgen-Ray Findings in Healthy Adults.**—A careful physical examination of the chest of fifty healthy adults by Baetjer showed the pulmonary physical signs to be practically normal in eleven, definitely though not markedly altered in thirty, more obviously altered in seven and greatly changed in two. That the changes in the physical signs are the expression of corresponding changes in the lungs is borne out by the results of the Roentgen-ray examinations made by Baetjer. Forty-six of the series had roentgenograms taken and in only six were the apices found to be normal. The results of the physical and Roentgen-ray examinations, although agreeing in a large proportion of the cases, still not infrequently are at variance. In twenty-two of the forty-six cases the agreement is complete. The disagreement in the remaining twenty-four cases is as follows:

In six instances the physical examination shows practically normal conditions, whereas the Roentgen-ray examination shows slight apical clouding. In eighteen instances the physical examination indicates a definite lesion at one apex, whereas the Roentgen-ray examination shows clouding at both apices. In four instances the physical examination indicates a slight lesion at one apex whereas the Roentgen-ray examination shows clouding at the opposite apex. In all four instances the changes in the physical signs were very slight. In two instances the physical examination indicates slight abnormalities at one apex whereas the Roentgen-ray examination shows both apices to be clear. In four instances the physical signs indicate a lesion at both apices, whereas Roentgen-ray examination reveals clouding at only one apex.

Archives of Ophthalmology, New Rochelle, N. Y.

November, XLIII, No. 6, pp. 591-694

34 Tangent Curtain. A. Duane, New York.
35 Sclerocorneal Trephining for Glaucoma, Complications and Failures in One Hundred Cases. A. Quackenboss, Boston.
36 Simple Angioma of Choroid. J. M. Love, Boston.
37 Easy Method of Enucleation. F. Fergus, Glasgow, Scotland.
38 Case of Extensive Accidental Corneal Splitting. A. C. Snell, Rochester.
39 Attachment for Taking Light Fields. D. N. Dennis, Erie, Pa.
40 Case of Bilateral Keratoconus, Examined Anatomically; Hemosiderin Ring of Cornea in Keratoconus and Hemosiderosis of Eye in Diabete Bronze. B. Fleischer, Tuebingen.
41 Self-Supporting Eye Clinic for Working People. M. M. Davis, Jr., and E. Hartshorn, Boston.

Boston Medical and Surgical Journal

November 19, CLXXI, No. 21, pp. 767-802

42 *Chlorophyll Test of Gastric Motility. F. W. White, Boston.
43 Increase of Total Nitrogen and Urea Nitrogen in Cerebrospinal Fluid in Certain Cases of Insanity; Uric Acid Content of Blood. H. M. Adler and B. H. Ragle, Boston.
44 *Use of Radium in Cancer and Allied Conditions at Huntington Hospital. T. Ordway, Boston.
45 Intra-Abdominal Hemorrhage Complicating Normal Pregnancy. F. G. Balch and R. M. Green, Boston.

42. **Chlorophyll Test of Gastric Motility.**—In answer to the question whether the test is better than older methods of

testing gastric motility, White says that it is simpler than most; makes little demand on the appetite, and is very easy on the stomach. It is readily used in patients who are vomiting, or who are on a very simple light diet, in which a big meal is uncomfortable or impossible. The sources of error are few and probably unimportant and no considerable disturbance of motility escapes detection. It is an easy method of following results of treatment of gastric stasis. It is probably not superior in accuracy and not likely to replace the best of the older tests, but it is simpler and easier for both physician, and patients in a large group of cases and gives an extra "string to our bow."

44. **Use of Radium in Cancer and Allied Conditions.**—The best, apparently curative, results from radium therapy, Ordway states, are obtained in certain types of skin and other localized forms of cancer. In myelogenous and lymphatic leukemia the blood picture becomes almost normal, the spleen is reduced markedly in size and certain symptoms may be relieved without toxemia resulting. In many cases of true cancer which have advanced beyond the operable stage, or those recurring after operation, improvement from radium therapy may follow not only subjectively but in the local condition. This improvement may include relief from discharge, hemorrhage and pain; cleansing or healing of ulceration; diminution in size or disappearance of the growth. Such cases, however, are rarely cured. Even large growths sometimes disappear under the influence of radium but metastasis or spreading of the growth to other parts is not prevented, or the patient may succumb to the rapid disintegration of the original growth. Newer methods may improve these results of radium therapy; at present its proved value is limited, but occasionally cases beyond these well recognized limits are distinctly benefited.

Delaware State Medical Journal, Wilmington

September, V, No. 10, pp. 1-26

46 Use of Liquid Chlorin for Sterilizing Water. J. E. Kienle, Wilmington.

Georgia Medical Association Journal, Augusta

November, IV, No. 7, pp. 197-226

47 *Cerebrospinal Syphilis. W. R. Houston, Augusta.
48 Artificial Pneumothorax. E. C. Thrash, Atlanta.
49 *Headaches. W. H. Malone, Marietta.
50 Perineal Hernia. W. F. Shallenberger, Atlanta.

47 and 49. Abstracted in THE JOURNAL, May 9, 1914, p. 1499.

Journal of Outdoor Life, New York

November, XI, No. 2, pp. 321-351

51 *Ten Years' Work at Gaylord Farm Sanatorium. I. Fisher, New Haven, Conn.
52 When to Take the Cure, and Why. E. Cummings, Hinton, W. Va.
53 Effective Work with Small Resources. H. W. Slocum, Minneapolis.
54 Use of Exercise in Treatment of Tuberculosis. C. W. Mills, Loomis, N. Y.

51. **Ten Years Work at Gaylord Sanatorium.**—With the Gaylord Farm Sanatorium, the state home for tuberculosis, with the New Haven Hospital equipment, the New Haven Dispensary for tuberculosis, the house to house work for the Visiting Nurses' Association, the New Haven Employees' Relief Association, with the Day and Night Camps, the out-of-door and open-window schools, the Improved Housing Association, the Waterbury Antituberculosis League, the Meriden Tuberculosis Relief Association, and the State Board of Health, Fisher says, New Haven County has one of the best equipments for fighting tuberculosis in the United States or in the world. Outside of the county the state tuberculosis commission has its other homes and there are several local antituberculosis organizations, including a summer camp for girls at Litchfield, maintained by the Reverend Mr. Chapman. Active work is being done in Hartford, South Manchester, New Britain, Norwalk, Stamford and Bridgeport. Outside of the state of Connecticut the influence of Gaylord Farm has been not inconsiderable. It has been the inspiration for the formation of other antituberculosis associations and sanatoria, hospitals and dispensaries. It has supplied what many believed to be the best type or model for combining the activity of the state and of the general public in the hygiene of tuberculosis. In states in which sanatoria have been instituted by the government without private cooperation, they have been more or less blighted by politics. In cases in which, on the other hand, antituberculosis work has been undertaken without state aid, it has been crippled for lack of funds. A happy combination of state aid and private initiative seems to be the true solution. Aside from supplying a model for organization and administration, the association has lent specific aid to the antituberculosis work outside of the state.

The National Association has helped to establish over 1,000 state and local antituberculosis societies; helped to secure over 550 hospitals and sanatoriums, with more than 35,000 beds for patients; 400 dispensaries, with over 1,000 physicians in attendance; over 200 open air schools and fresh air classes for anemic and tuberculous children; and more than 3,000 nurses engaged in tuberculosis work. It has helped to get laws passed in forty-five states and local ordinances in over 200 cities, dealing with the treatment and the prevention of tuberculosis. Active field campaigns of education in forty states and territories have been carried on and no less than 100,000,000 pamphlets on tuberculosis have been distributed in the last ten years. The National Association has expended in ten years only $200,000 but has stimulated national, state and local agencies to expend about $100,000,000. It is reported that out of $20,000,000, which were expended last year in the fight against tuberculosis, over two-thirds, or nearly $14,000,000, were expended out of public funds. These include expenditures by federal, state, county or municipal governments. The best way of registering statistically the general effect of the antituberculosis movement is in the reduction of the death-rate. It is found, according to the census reports, that tuberculosis in all its forms in the states in which registration has been kept since 1900, has declined from 181 per 100,000 in 1901 to 150 per 100,000 in 1911. This is a decline of 17 per cent. in ten years, the decline being 12 per cent. for males and 23 per cent. for females.

Journal-Lancet, Minneapolis

November 15, XXXIV, No. 22, pp. 583-614

55 Relations Between Newspaper Press and Medicine. B. Foster, St. Paul.
56 Some of the Problems of State Sanatorium. J. G. Lamont, Dunseith, N. Dak.
57 Diseases of Urinary Tract Produced by Diseases of Genital Tract in Female. A. C. Stokes, Omaha.

Lancet-Clinic, Cincinnati

November 14, CXII, No. 20, pp. 523-548

58 New Cincinnati General Hospital. E. G. Zinke, Cincinnati.
59 Medical Investigations. W. E. Magruder, Baltimore.
60 Sources of Wassermann Error and Their Control. A. Faller, Cincinnati.
61 Shall Early Amputation Be Done in Compound and Comminuted Fractures? J. E. Pirrung, Cincinnati.

Medical Record, New York

November 21, LXXXVI, No. 21, pp. 867-908

62 Public and Profession: A Criticism. D. Hecht, Chicago.
63 Plea for Research into Possibility of Cure of Dementia Præcox by Use of Serum Containing Defensive Ferment. B. Holmes, Chicago.
64 *Association of Follicular Tonsillitis with Acute Gastric Fever. L. Fischer, New York.
65 Sexual Significance of Recent Fashions. E. H. Williams, Los Angeles.
66 Clinical Significance of the Human Countenance. W. P. Cunningham, New York.
67 Vincent's Angina. H. H. Amsden, Concord, N. H.
68 Case of Acute Thyroiditis. I. W. Voorhees, New York.
69 Relation of Gynecology and Urology to General Surgery. H. Lilienthal, New York.

64. **Association of Follicular Tonsillitis with Acute Gastric Fever.**—The frequent occurrence of gastric fever, Fischer says, demands a careful inspection of the tonsils and when such tonsils show evidence of hypertrophy they should be treated as diseased tissue which may be a focus for future malignant infections. Loss of appetite, or rather a refusal to eat, will be noted; all symptoms pointing to a gastric derangement will be present, and still the predominating

symptom will be the patches or follicles on the tonsils, causing pain on swallowing. Fischer emphasizes that too much importance cannot be placed on the necessity for throat inspection in every child that refuses to eat.

The treatment he advocates is as follows: An alkaline laxative such as a 3 to 5 grain dose of compound jalap powder should be given and repeated every three hours until a thorough evacuation have been produced. During this eliminative treatment water should be given liberally but no food. Locally, for the throat tincture of iodin diluted with an equal quantity of water should be applied once with the aid of a cotton swab. After the bowels have been thoroughly cleaned, chicken soup or milk from which the cream has been skimmed or weak tea may be permitted. For the after-treatment 1 or 2 drops, depending on the age, of tincture of nux vomica may be given before meals.

Missouri State Medical Association Journal

November, XI, No. 5, pp. 207-248

70 Status Lymphaticus and Status Hypoplasticus and Their Relationship to Glands of Internal Secretion. W. W. Duke, Kansas City.
71 Treatment in Heart Disease. C. H. Neilson, St. Louis.
72 Roentgen Method in Ileocecal Diagnosis. E. H. Skinner, Kansas City.
73 Auto-Intoxication and Its Relation to Intestinal Indigestion. D. F. Manning, Marshall.
74 Missouri Prehistoric Mortars and Pestles. H. M. Whelpley, St. Louis.
75 Fracture of Patella and Its Treatment. T. C. Boulware, Butler.
76 Dacryocystitis, Caused by Membranous Closure of Nasal Duct. M. Wiener and W. E. Sauer, St. Louis.

New York Medical Journal

November 21, C, No. 21, pp. 997-1048

77 Insanity and Divorce. A. Gordon, Philadelphia.
78 Teratoma Testis with Tubercle Bacilli in Urine. V. C. Pedersen, New York.
79 Implantation of Pituitary Gland. E. Waitzfelder, New York.
80 Solution of Problem of Criminal Abortion. P. S. Madigan, Washington, D. C.
81 *Intraspinous Medication. O. Berghausen, Cincinnati.
82 Hyperchlorhydria. A. L. Holland, New York.
83 *New Method of Hastening Repair after Fracture. H. J. Kauffer, New York.
84 Need of More State Hospitals for Insane. J. A. Jackson, Philadelphia.
85 Rôle of Cecum in Chronic Disorders in Right Lower Abdomen. J. M. Wainwright, Scranton, Pa.
86 Tuberculosis of Kidney. J. A. Gardner, Buffalo.
87 Early Pulmonary Tuberculosis. C. H. Cocke, Asheville, N. C.
88 New Poison Containing Bottle. R. J. Lackner, New York.

81. **Intraspinous Medication.**—Following the intraspinous introduction of 5 c.c. normal saline solution rather rapidly, a gradual increase in the pressure was noted by Berghausen there being no sudden variations; as when tricresol is added in 0.5 per cent. concentration, to the normal saline solution, there was a sudden rise then a fall, and a secondary rise. The same result was obtained when the tricresol was added to distilled water in the same concentration. The needle was introduced into the spine, a few drops of fluid were allowed to flow, the needle was withdrawn, then introduced into another interspace in the lower lumbar spine, and so on. There were distinct variations in pressure, now a rise and then a fall. Apparently, then, the simple procedure of spinal puncture is likely to be followed by variations in the peripheral blood-pressure.

Berghausen is convinced from a study of this and other experiments that sudden variations in peripheral blood-pressure are likely to follow the simple procedure of spinal puncture and the subsequent injection of simple solutions; that the addition of tricresol in 0.5 per cent. concentration has no distinct deleterious effect beyond the slight toxic effect which all phenol derivatives possess in this concentration and which makes them useful as antiseptics; that serious damage can be done to the cord through the insertion of the needle too high into the spine, the immediate damage being probably due to hemorrhage, chiefly subdural.

In accordance with these findings, Berghausen controls all intraspinous injections by taking the peripheral blood-pressure after the method of Sophian. Particularly in epidemic meningitis, sudden variations in the peripheral blood-pressure are noticeable. In fact, it not infrequently becomes necessary again to withdraw the serum (using the gravity method only), owing to the fact that the blood-pressure had fallen distinctly, at times 30 to 50 mm. below the original pressure. In Berghausen's experience, sudden respiratory changes follow only when the blood-pressure has suffered a marked change, usually a drop. It is a safe rule never to withdraw the needle until the blood-pressure at the close of the injection has about reached that which was registered at the outset. The gravity method is of distinct value in attaining this end, since it affords a ready means of withdrawing the serum and fluid.

83. **New Method of Hastening Repair After Fracture.**—Kauffer makes use of homogeneously granulated bone incorporated with petrolatum, injected into and between the fractured ends of bone, to encourage repair in fractures, especially in cases of delayed union. A piece of bone (a fresh specimen obtained from the morgue) is dried and ground up to a powder, mixed with petrolatum to a consistence of bismuth paste, sterilized by placing in a large bottle, which is placed up to the neck in water and boiled for two hours. Keep in a cool place. When required, it should be warmed and well mixed by shaking, taken up into a 4 or 8 c.c. syringe, using a long needle, with a bore about gauge 20.

After the fracture has been extended and approximated, it is located by digital examination and Roentgen ray; the needle is introduced through the skin and fascia to the seat of fracture, the rough edges of which are readily appreciated. The needle is then passed as deeply as possible between the fractured ends. The contents of the syringe are injected as the needle is slowly withdrawn to the surface of the bone, when injecting must stop and the needle be removed. This procedure may be repeated into the fracture at several angles, if necessary, thus infiltrating the entire mass between the fractured ends with petrolatum and bone cells, which act as a focus for osteogenesis. The powdered bone and petrolatum are also recommended wherever bone is required. Kauffer says that the powdered bone invites calcareous deposits and encourages a metaplasia of the adjacent tissue cells.

Northwest Medicine, Seattle, Wash.

November, VI, No. 11, pp. 325-358

89 Digitalis Heart Block. T. H. Coffen, Portland, Ore.
90 Graphic Studies in Cardiac Arhythmia-Ectopic Systole. M. H. Tallman, Boise, Ida.
91 *Case of Trachoma Treated with Bacillus Lactis Bulgaricus. C. R. Hudgel, Boise, Ida.

91. **Trachoma Treated with Bacillus Lactis Bulgaricus.**—Hudgel's method of treatment was as follows: One per cent. atropin once daily; hot fomentations three times daily; twice during the course of treatment he turned the lids back and scarified them thoroughly with a small bistoury. They bled freely. Twice daily he reduced to powder a tablet of the Bulgarian bacillus and dusted it on each everted lid. No astringents or other remedies were used. The improvement was marked from the start. The copious lacrimation was checked at once and the patient said his eyes felt much cooler and easier. The ulcers healed and the pannus gradually disappeared. The improvement of vision kept pace with the amelioration of the various phases of the disease. When discharged two weeks after commencing treatment vision with correction was 15/20. The eyes were clear and felt free from irritation.

Ohio State Medical Journal, Columbus

November, X, No. 11, pp. 647-726

92 Salvarsan and Neosalvarsan Treatment of Syphilis. M. L. Heidingsfeld, Cincinnati.
93 Practical Consideration of Heredity Presented in Certain Anomalies of Eye. I. G. Clark, Columbus.
94 Outline of Organization of Department of Health Along Welfare Lines. A. L. Light, Dayton.
95 Internal Closure of Femoral Opening for Hernia. C. E. Briggs, Cleveland.
96 Present-Day Methods for Finding Tubercle Bacillus. T. Zbinden, Toledo.
97 Problems of Intern Service. V. A. Dodd, Columbus.
98 Benzol Treatment of Leukemia. E. W. Mitchell, Cincinnati.
99 Foot as Affected by Modern Shoe. M. Millikin, Hamilton.
100 Review of Post Urethroscopy. S. Englander, Cleveland.

Oklahoma State Medical Association Journal, Muskogee

November, VII, No. 6, pp. 171-202

101 Congenital Defects of Eyes that Manifest Themselves in Children. L. H. Buxton, Norman.
102 Suppurative Otitis Media. L. A. Newton, Guthrie.
103 Id. J. B. Ferguson, Sallisaw.
104 Plea for Early Intubation by General Practitioner. A. P. Gearhart, Blackwell.
105 Pharyngeal Diagnosis from General Practitioner's Standpoint. W. E. Dixon, Oklahoma City.

Ophthalmic Record, Chicago

November, XXIII, No. 11, pp. 541-594

106 Operations on Extra-Ocular Muscles. E. Jackson, Denver.
107 Heterophorias and Their Treatment. G. C. Savage, Nashville, Tenn.
108 Unanswered Questions Concerning Heterophoria and Heterotropia. L. Howe, Buffalo.

Public Health Journal, Toronto

November, V, No. 11, pp. 659-704

109 Municipal Loans and Municipal Works. R. O. Wynne-Roberts, Regina, Sask.
110 Pasteurization of Milk. L. C. Bulmer, Regina, Sask.

Southern Medical Journal, Mobile

November, VII, No. 11, pp. 855-914

111 "Indigestion" Forerunner of Diseases of Cardiovascular and Renal Systems. F. M. Hodges, Richmond, Va.
112 Uncinariasis and Pregnancy—Dangers. J. S. Turberville, Century, Fla.
113 Condition of Negro in South. F. G. DuBose, Selma.
114 Simple and Inexpensive Filter. P. C. Fauntleroy, Fort Monroe, Va.
115 Sarcoma of Chest-Wall. Report of Case. C. Collier, Memphis, Tenn.
116 Intestinal Stasis. Ceco-Sigmoidostomy for Hirschsprung's Disease. S. H. McLean, Jackson, Miss.
117 Transfusion—Direct and Indirect. Simplified Methods. B. M. Bernheim and A. P. Jones, Baltimore.
118 Abduction and Fixation of Elbow in Treatment of Fractures of Surgical Neck of Humerus. I. Cohn, New Orleans.
119 Local Treatment of Gonorrheic Infections. M. C. Sycle, Richmond, Va.
120 Gumma of Anterior Urethra. J. C. Vinson, Tampa, Fla.

West Virginia Medical Journal, Wheeling

November, IX, No. 5, pp. 145-180

121 Spina Bifida. Report of Cases. S. S. Gale, Roanoke, Va.
122 Prevention of Insanity. C. A. Barlow, Spencer.
123 Prostatectomy. W. D. Hamilton, Columbus.
124 Hereditary Mental Deficiency. J. W. Williams, Richmond, Va.
125 Some More Truth About Alcohol. I. Hardy, Morgantown.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

Archives of Roentgen Ray, London

November, XIX, No. 6, pp. 199-234

1 Roentgen Rays in War. F. Lemon.
2 Localizing Simply and Immediately. W. Hampson.
3 Diathermy—Its Production and Use in Medicine and Surgery. E. P. Cumberbatch.
4 Radiometry. T. Christen.
5 Treatment of Recurrences and Metastases from Carcinoma of Breast. G. E. Pfahler.

British Journal of Surgery, London

October, II, No. 6, pp. 189-350

6 Exploration of Knee-Joint. E. M. Corner.
7 Rhizotomy for Spastic Paralysis. G. E. Waugh and Others.
8 Id. For Relief of Gastric Crises in Tabes Dorsalis. G. Barling and Others.
9 Id. For Relief of Pain. B. Kilvington and Others.
10 *Anoci-Association. C. A. Pannett.
11 Case of Suppurative Colinephritis. F. J. F. Barrington.
12 Contemporary Italian Surgery. R. Bastianelli.
13 Chronic Subdural Hemorrhage of Traumatic Origin and Its Relation to Pachymeningitis Hemorrhagica Interna. W. Trotter.
14 Radical Operation for Cancer of Rectum. W. E. Miles.
15 *Etiology of Appendicitis, Gastric Ulcer and Allied Conditions. R. G. P. Lansdown and G. S. Williamson.

10. **Anoci-Association.**—Pannett experimented on cats and rabbits and found that afferent impulses set up by incision of the abdominal wall in the linea alba can be prevented from reaching the nerve centers by local infiltration with novocain, as recommended by Crile. When the incision is not in the middle line, these impulses can be blocked only by anesthetizing the nerve trunks as well as employing local infiltration to render the nerve-endings insensitive. This procedure may necessitate the waiting of some minutes between the injection of the anesthetic and the severance of each layer. If perineural injections are employed, 1 per cent. novocain must be used. Afferent impulses resulting from manipulation of the viscera have in general a more pronounced effect on the vasomotor center than those resulting from the opening of the abdomen and the retraction of the edges of the wound. To bring about a condition of anoci-association of the nerve centers, it is as essential to cut off impulses ascending from the viscera as it is to block those coming from the abdominal wall. Afferent impulses set up by manipulation of the stomach, intestine and the attachments of these viscera, may be blocked by local anesthetization of these attachments. The tone of the abdominal muscles is increased by the manipulation of the viscera or by dragging on the parietal peritoneum. This reflex rigidity can be eliminated by locally anesthetizing the abdominal wall and by blocking impulses from the viscera.

15. **Etiology of Appendicitis.**—Appendicitis, gastric and duodenal ulcer, and probably certain forms of mucous colitis, Lansdown and Williamson hold originate from the action of some noxious agent on these structures. These diverse conditions are essentially associated with one another as the result of an underlying common cause; and sepsis and chronic ulceration are either secondary features or sequela of such disorder. There are in the substances of the mucous membrane of the intestinal tract certain small round-celled aggregates more or less distinct from the lymphoid follicles. These structures are associated with a particularly simple epithelium. They occur in areas of concentration in the stomach, duodenum, appendix and upper rectum. The distribution within the stomach and duodenum occupies what might be called the ulcer area. They appear to suffer some general enlargement or destruction in appendicitis, gastric and duodenal ulcer, and certain form of dyspepsia. Sepsis as a secondary process can be engrafted on such changes in the appendix, and it is to be considered as a sequela. Similarly, chronic gastric and duodenal ulcer is the outcome of some secondary irritation acting on these diseased foci. There is a pathologic link between appendicitis, certain dyspepsias and chronic gastric ulcer.

British Medical Journal, London

October 31, II, No. 2809, pp. 741-776

16 *Treatment of Arthritic Deformities. R. Jones.
17 *Mechanical Considerations of Human Foot. H. S. Rowell.
18 *Soldiers' Feet and Footgear. C. Webb-Johnson.
19 Insects and War; Mites. A. E. Shipley.
20 Simple and Rapid Method of Localizing Bullets. F. Hernaman-Johnson.
21 Medical Care of Lines of Communication at Home. C. B. Heald.
22 Pinewood Sawdust as Surgical Dressing. R. Parker.

November 7, No. 2810, pp. 777-820

23 *Significance of Blood-Pressure Readings in Man. J. A. MacWilliam and G. S. Melvin.
24 Barber-Surgeons Company. T. G. Lyon.
25 Insects and War: Mites. A. E. Shipley.
26 Reform of Vital Statistics of Nation. V. Horsley.
27 Legal Investigation of Causes of Death in Scotland. W. G. A. Robertson.
28 Necessity for Reforming Coroner's Inquest. J. C. McWalter.

16. **Treatment of Arthritic Deformities.**—Jones emphasizes that deformities are preventable if a surgeon be acquainted with the natural course of disease. In view of ankylosis the joint should be allowed to become fixed in the position of greatest usefulness as regards function. In children most deformities can be corrected by manipulation and osteotomies and exsection of bone are very rarely required. The reduction of deformity in a septic or tuberculous joint during the existence of disease can be safely undertaken if it be immediately followed by fixation. In sound fibrous ankylosis of the hip an osteotomy should be preferred for the correction of adduction, as some recurrence of deformity would follow reduction by manipulation.

The site of osteotomy will depend on the nature of the ankylosis and on the extent of the deformity. Transtrochanteric osteotomy gives the most accurate mechanical result. It should be practiced in all cases of bony fixation in which the femoral neck is not absorbed and in which there is no marked pathologic dislocation. In cases in which the destruction of the head and neck have occurred and the femur lies close on the pelvis, a wedge should be removed from the neighborhood of the trochanter. In cases of fibrous ankylosis in the process of becoming sound, a subtrochanteric osteotomy is indicated to prevent strain on fibrous bands. All osteotomies require subcutaneous division of the adductors. Subtrochanteric osteotomy is contra-indicated in cases in which flexion is extreme.

Arthroplasty of the hip-joint in any of its many forms, Jones says, may be looked on as a valuable and successful procedure. The character of the intervening substance whether bone, free or pedunculated fascial flap, fat, or muscle, is not so important as a good technic and a sound judgment. It should not be performed on children nor in the presence of active disease. It should be reserved for adult life, and has proved more successful after recovered septic than after tuberculous disease, and in case of septic disease it should be postponed for one or more years until the periarticular structures have become more normal.

The results of arthroplasty of the knee are not too encouraging. In bony ankylosis of the femur and tibia the results are distinctly discouraging. In those instances in which the ankylosis is fibrous, with perhaps bony fixation of the patella, results are often good. In such conditions, however, Jones states, mobility may often be secured without operation. In painful and progressive deformities, such as in osteo-arthritis of the hip, many procedures may be expected to give relief by preventing the friction of tender joint surfaces.

17. **Mechanical Considerations of Human Foot.**—Rowell's main conclusion is that for the ordinary inactive life of the drawing-room, office and shop, high-heeled boots and shoes may be advantageous in giving to the feet a pleasant, braced-up feeling, quite different from that enjoyed or suffered by those who slither about in heelless slippers.

18. **Soldiers' Feet and Footgear.**—When a man's feet are sore and inflamed, but not blistered, Webb-Johnson says, it is advisable for him regularly to do one of the following: (a) Rub the feet night and morning with spirit, to which may be added 1 to 2 per cent. of salicylic acid. (b) Paint the tender parts once or twice a day with either a saturated solution of picric acid or a solution of chromic acid (2 to 3 grains to the ounce). (c) After drying the feet, sprinkle with a powder composed of talc and salicylic acid (salicylic acid 2 grains, talc 1 ounce). (d) Soak the feet in a bucket of cold water to which potassium permanganate, salt, alum, tannic acid, or saltpeter has been added.

Men who complain of excessive sweating of the feet should soak them daily in a solution of formalin and water (1 to 800), dry them, and dust them with zinc oxid or some other powder. Tender feet may be well greased with zinc or boracic ointment, or the soles of the feet may be soaped. When a man's feet are normally fatigued at the end of a long march, after he has washed and dried them, he will find great relief if he lies down and raises the feet by resting them against some firm object.

If, in spite of all these precautions, a blister forms, the fluid should be evacuated aseptically and the surplus skin, liable to cause pressure cleared away. An antiseptic ointment should then be applied and the blister covered with stockingette plaster. As, after the heel, the most common situation for a blister is the plantar aspects of the fourth and fifth toes, it is in this case advisable to use animal wool round and under the toes to counteract the flexion which causes the pressure on these parts.

23. **Significance of Blood-Pressure Readings in Man.**—In doing blood-pressure estimations MacWilliams and Melvin find it desirable to determine the diastolic index while the armlet pressure is being raised; in some (rare) cases in which arm compression leads to a marked rise of blood-pressure, the diastolic reading taken with a rising armlet pressure may differ from that obtained during the lowering of the armlet pressure (after determining the systolic index) by as much as 20 mm. This is especially the case when simultaneous estimations are made in the two arms. But a decided effect is sometimes observed when only one arm is tested. Comparison of the diastolic values with rising and falling armlet pressures may thus give important indications of the liability of the arterial pressure to vary in an abnormal way, when a large artery is closed, as in the process of systolic estimation.

As regards the impressions derived from digital examination of the pulse, they have found the impression gained as to (a) the tension in the vessel within the beats (diastolic pressure), and (b) the extent of the change at systole (pulse pressure) to be specially fallacious in some cases—apparently more deceptive than the impression as to the compressibility of the pulse (systolic pressure). An enormous pulse pressure (for example, 120 mm. in a case of aortic regurgitation) may be present, as shown by measurement of the systolic and diastolic pressures, when the finger fails to give any adequate conception of such a pressure wave along the artery. And the measured diastolic pressure may be very high when the impression given by digital examination is that it is rather low.

Bristol Medico-Chirurgical Journal, London

September, XXXII, No. 125, pp. 193-256

29 Local Analgesia in Surgical Operations. A. L. Flemming.
30 *Case of Richter's Strangulated Hernia. C. A. Moore.
31 Roentgenographic Centroscope and Roentgenographic Episcope. W. Cotton.

30. **Case of Richter's Strangulated Hernia.**—In Moore's case the operation was followed by no marked shock, but paralysis of the bowel caused a highly critical condition for the next few days. Enemata were useless, but a course of intramuscular injections of pituitary extract given simultaneously with a turpentine enema produced the desired result.

Practitioner, London

November, XCIII, No. 5, pp. 589-732

32 Diagnosis of Nasal Accessory Sinus Disease. W. S. Syme.
33 Diffuse Sclerodermia: Report of Two Cases. A. Howell.
34 Psychic Factor in Insomnia. H. C. Miller.
35 *Pruritus Ani. L. E. C. Norbury.
36 Anesthesia. J. Blumfeld.
37 Diseases of Lungs. A. J. Jex-Blake.
38 Anemia with Enlargement of Spleen. J. S. McKendrick.
39 Etiology and Prevention of Rickets. D. Curle.
40 Choice of Winter Health Resorts. R. F. Fox.
41 *Rhinosporidium Kinealyi. T. S. Tirumurti.
42 Diaphragmatic Hernia of Stomach and Part of Small Intestine. W. E. Graves.

35. **Pruritus Ani.**—In every case of pruritus ani, in which no satisfactory causative factor can be found by external examination or examination of the anal canal with the sphincteroscope, Norbury urges that a thorough investigation of the rectum and pelvic colon by means of the sigmoidoscope should be carried out. In this way hidden lesions may be discovered, and treatment established on a sound basis. For instance, pruritus may be the result of irritating discharges from simple or malignant growths in the bowel, from certain forms of colitis or proctitis; granular proctitis or the hypertrophic catarrhal variety. Norbury has had several cases of pruritus ani associated with a large granular patch of mucous membrane, and situated in the lower part of the rectum proper; treatment by rectal injections with sulphate of zinc and local applications of silver nitrate has given considerable relief.

41. **Rhinosporidium Kinealyi.**—Tirumurti shows by a recital of cases that the name Rhinosporidium is a misnomer, because the parasite is found in other situations than the nose, though the nasal mucous membrane is its favorite site. The occurrence of the sporozoon in the conjunctival and nasal mucous membrane is explained by direct inoculation through infected clothing, handkerchiefs, or the hands. The spores are discharged in the nasal secretion, which is rather

profuse in patients who suffer from this parasitic polypus in the nose, and who are subject to chronic nasal catarrh and profuse bleedings from the nose.

The growth of the parasite being usually one of long duration, the source of the infection is forgotten and a history of close contact is not easily elicited. The preponderance of the parasitic cysts in large numbers, mainly in the epithelial and subepithelial tissues, is also suggestive of this mode of conveyance of the disease by infected nasal secretion. The occurrence of the parasite in the penis in a man who was otherwise healthy and showed perfectly normal appearances of the conjunctiva and nasal mucous membrane, is very suggestive of direct inoculation through sexual congress.

Tirumurti suggests that rhinosporidial polypi do occur in the mucous membrane of the mouth, anus and vagina, but are overlooked, microscopic examination not being conducted in every case. The growths have a great tendency to recur, though after their removal the bases are cauterized. Thorough cauterization may prevent a recurrence. The clinical features of the growths are characteristic, though the characters are modified according to the site of their occurrence. The recurrence and innumerable number of cysts of the parasite, in different stages of development in a small fragment of the tissue affected, are in favor of the sporozoon undergoing its complete cycle of development in the human body without the intervention of an intermediary host.

Sei-I-Kwai Medical Journal, Tokyo

October, XXXIII, No. 10, pp. 59-64

43 *Excretion of Arsenic in Urine after Subcutaneous or Intravenous Injection of Salvarsan. K. Irokawa.

43. **Excretion of Arsenic in Urine After Injection of Salvarsan.**—Irokawa injected salvarsan either subcutaneously or intravenously in eight cases of syphilis, two cases of tabes dorsalis and one case of epilepsy and examined the daily excretion of arsenic in the urine for from three to thirty-nine days. He found that from 40 to 90 per cent. of the arsenic injected is excreted in the urine. When salvarsan is injected subcutaneously, it remains at the site of the injection unabsorbed and one can detect the arsenic in the urine, even when it does not cause any inflammation, after three weeks. The excretion of arsenic after intravenous injection is quite slow; and one can prove the presence of arsenic in the urine even after three weeks. In a relatively large number of the cases 10 per cent. of the arsenic is excreted during the first day, but the greater part is excreted in the course of the first week.

Bulletin de l'Académie de Médecine, Paris

October 27, LXXVIII, No. 33, pp. 179-230

44 Advantages of Double Gloves and Socks in Cold Weather. (Contre le froid aux mains et aux pieds.) Fernet.

45 *Surgery in the Base Hospitals. (Chirurgie de guerre dans les hôpitaux de l'arrière et du service d'évacuation des blessés.) Témoin.

46 Jagged Wounds from Rebounding Bullets. (Des blessures par balles de ricochet.) Rochard.

45. **Surgery in the Base Hospitals.**—Témoin declares that his experience with 800 wounded has confirmed anew the necessity for refraining from operative mutilations. . . . "One can never reiterate enough *combien il faut être sobre de mutilations chirurgicales.*" "Notwithstanding the vast destructive lesion, notwithstanding the distressing appearance of the shattered tissues, notwithstanding the way in which the bones are fractured at several points and project from the wound, even notwithstanding the appeals of the wounded who plead for amputation to put an end to their suffering, conservative surgery, thanks to the means now at our disposal, yields extremely satisfactory results, so satisfactory that we should consistently refuse to amputate when the wounded are first brought in. Almost all fractures, no matter what the complications, heal perfectly. All that is necessary is to disinfect the wound and immobilize the limb as early as possible." Prompt and definite immobilization was followed by rapid and complete healing in his thirty-seven compound fractures of the humerus, thirty-five of the leg and twenty-seven of the thigh. Only one man required amputation and he had developed tetanus. A wide gap is left in the plaster apparatus to permit dressing the wound. He warns against attempting to explore the wound with fingers or instruments; a simple flat dressing, not attempting to bring the lips of the wound together, is the entire surgical task for the first few days. If wounds of the skull do not prove immediately fatal, they seem to heal with less disturbance than with trauma of the skull under other conditions. In the latter case they are generally the result of a fall on the head and the whole brain suffers more from the concussion.

Certain complications of modern artillery wounds are opening up a new chapter of pathology and surgical practice. The infectious complications develop so rapidly that any intervention is futile. Another complication is the serious secondary hemorrhage which comes on the fourth to the tenth day, when the wound seems to be healing favorably. Then the wounded region, limb, axilla or neck begins to pain and swell, and the temperature runs up. The aspect of the region suggests an abscess but instead of pus when it is incised, a large mass of ill-smelling clots is evacuated with putrefied clots in the depths. If not incised, gangrene is almost certain to develop. If nothing is done but clear out the clots, the immediate relief is great, but during the day or night fulminating hemorrhage comes on, and many have died from this secondary hemorrhage. The only way to avoid it is to realize that when the region is thus uniformly swollen, with agonizing pain and total inability to use the limb—which is never observed with ordinary abscess or phlegmon—some vessel is bleeding into the tissues, and an emergency operation is called for to ligate this vessel above and below the lesion. He lost the first patient from gangrene but the other seventeen were saved by ligating the carotid or femoral arteries, the axillary and brachial or the latter alone or the popliteal or anterior tibial. The wounded should be carefully sifted so that those whose wounds require institutional care should not be taken where such is not available. The sifting out of the wounded is thus a very important task. It can be done on the trains during the transportation, and the case-card should be of a different color for those requiring special skill or equipment.

Archiv für klinische Chirurgie, Berlin

October, CV, No. 4, pp. 769-1051. Last indexed Oct. 24, p. 1509

47 *Surgical Stomach Disease. (Zur Chirurgie des Magens auf Grund von 1,100 in 7 Jahren behandelten Fällen.) H. Küttner.

48 Isolated Chronic Appendicitis from Schistosomum Eggs. S. Goto.

49 Ultimate Results with Sprengel's Plastic Transverse Abdominal Incision. (Dauerresultate der plastischen Bauchquerschnitte.) J. Bakes.

50 Improved Technic for Exarticulation of the Femur. (Erhaltung der Vena femoralis bis zur Auslösung des Schenkelkopfes bei der Exarticulatio femoris nach Rose.) B. Riedel.

51 *Transplantation of Thyroid Gland. (Bedingungen erfolgreicher Schilddrüsentransplantation beim Menschen.) T. Kocher.

52 Source of Regeneration in Case of Transplanted Bone. (Quelle der Regeneration bei Knochenüberpflanzung.) N. N. Petrow.

53 *Exophthalmic Goiter and the Thymus. (Basedow'sche Krankheit und Thymus.) A. Kocher.

54 *Restoration of or Substitutes for the Esophagus. (Ueber Oesophagoplastik im allgemeinen und über den Ersatz der Speiseröhre durch antethorakale Haut- Dickdarmschlauchbildung im besonderen.) V. von Hacker.

55 Roentgen Findings in Condyle After Injury of Knee. (Weitere Beobachtungen über den Stieda'schen Knochenschatten am Condylus internus femoris.) K. Vogel.

56 Operative Treatment of Bladder Tumors. (Blasentumoren.) O. Hildebrand.

47. **Operations on the Stomach.**—Küttner states that 10 per cent. of all his surgical work at Breslau in the last seven years has been on the stomach. In the total of 1,100 stomach cases two-thirds were malignant and only 20 per cent. of these were operable. The proportion of operable cases was lowest in patients who came from private practice. One woman was in the hospital for a year on account of multiple cysts in the upper third of the femur, first on one side and then on the other. Necropsy revealed that the cysts were metastases from a gastric cancer which had been entirely unsuspected, although the woman had been under super-

vision for all that time. Malignant disease of the stomach apart from the pylorus causes achylia and mechanical conditions like those artificially induced by a gastro-enterostomy. This explains why cancer of this kind can exist so long without attracting attention. In 15 per cent. of his cancer cases there had been preceding stomach trouble, but whether gastritis, ulcer or achylia is not known. In one case both a cancer and an ulcer were found in the stomach, and in another five or more separate cancers. The operable cases generally had a longer history of disturbances than the inoperable ones. Roentgenoscopy was usually disappointing except when it disclosed inoperable conditions. The Gluczinski method of differentiation proved reliable. The later the pain develops after eating, the nearer the pylorus the lesion is found.

He resects only when cancer cannot be excluded with absolute certainty; that is to say, he does resection in every case of tumor-forming callous ulcer, as he is convinced that this is in reality of cancerous nature. The fear of transformation of other forms of gastric ulcer into cancer is not borne out by his experience; there were only two in which cancer developed later, in his 120 cases, and the ulcer was of the callous type. After-hemorrhage from an ulcer treated by gastro-enterostomy was responsible for the death of one patient, and also for that of another treated by resection. Perforation did not occur after gastro-enterostomy in any instance, and the ultimate outcome was a complete cure of all disturbances in 65 per cent. and essential improvement in 20 per cent. The ultimate outcome was also surprisingly good after a gastro-enterostomy done for sagging of the stomach, thus kinking the pylorus. The results when the pylorus was excluded were no better than with simple gastro-enterostomy alone.

51. **Transplantation of the Thyroid.**—This report of Kocher's experimental and clinical experience fills nearly one hundred pages. He has only good results to report from the twenty-one patients treated by this means alone. The lessons learned from this material in regard to the conditions for success are presented in detail, as well as for the technic.

53. **Exophthalmic Goiter and the Thymus.**—Kocher states that no instance of Basedow's disease is yet known in which at necropsy or operation the thyroid was found free from hyperplasia, but the thymus is often apparently normal. In nearly 50 per cent. of all cases of Basedow's disease a tendency to tardy hyperplasia or tardy involution of the thymus is evident. Hyperplasia of the thymus is more frequent in younger Basedow patients. No special histologic findings were discovered in the thymus with Basedow's disease at necropsy of fourteen cases; six had died under operative treatment and eight from the Basedow alone. When there is hyperplasia of the thymus, the patient might be prepared for an operation on the thyroid by a course of thymus extract and Roentgen exposures of the thymus, just before the operation on the thyroid.

54. **Antethoracal Restoration of the Esophagus.**—Von Hacker gives a profusely illustrated description of the technic with which he provided a girl of 12 with a functionally capable esophagus after the natural passage had been impassibly corroded by swallowing a tablespoonful of lye. It had been given her by her mother, who took a similar dose and died of the injury. The operation was done at several sittings, the entire procedure requiring about six months. The plan was to take a segment of the transverse colon and implant it in the lesser curvature of the stomach and bring the other end up under the skin nearly to the clavicle. The esophagus was severed above the stenosis and the proximal stump brought out through a transverse incision in the neck and worked down under the skin and sutured to the upper end of the colon segment. The illustrations show a healthy girl with scarcely any trace of her injury except a linear scar from the umbilicus to the neck.

Berliner klinische Wochenschrift, Berlin

October 19, LI, No. 42, pp. 1717-1736

57 *Treatment of Tetanus, Especially with Magnesium Sulphate. W. Weintraud and E. Unger.

58 Principles of Dietetics. (Die Kost der Arbeiter und die Grundsätze der Ernährung.) F. Hirschfeld.

59 Treatment of Lupus. A. Alexander.

October 26, No. 43, pp. 1737-1756

60 *Treatment of Cholera. L. Lichtwitz.

61 Application to Gait of Man and Animals of Laws of Velocity. (Anwendbarkeit des Gesetzes der korrespondierenden Geschwindigkeiten auf die Gangbewegung von Menschen und Tieren.) R. du Bois-Reymond.

62 Exaggeration of Symptoms from Spinal Tumor After Lumbar Puncture. (Ueber im Anschluss an die Lumbalpunktion eintretende Zunahme der Kompressionserscheinungen bei extramedullären Rückensmarkstumoren.) L. Newmark (San Francisco).

63 Neosalvarsan for Children. (Anwendung der epifascialen (bzw. intramuskulären.) Neosalvarsaninjektionen nach Wechselmann im Kindesalter.) H. Kern.

64 Congenital Dropsy. (Angeborene Wassersucht.) H. Wienskowitz. Commenced in No. 42.

65 Aviators' Arrows. (Der Pfeil als Fliegerwaffe.) H. Coenen.

57. **Tetanus.**—Weintraud says that the number of cases of tetanus among the wounded makes it imperative to recognize the first symptoms of it, which only too often the patient—"in his touching patience and ignorance of the dangers to which he is exposed"—regards as too trivial to mention. They may include dizziness, heavy sweats, slight difficulty in urination, a feeling of tightness in the muscles of the jaws or back of the neck, or brief spasms of the muscles of the chest or of the diaphragm. The latter are liable to be mistaken for pleurisy pains. The technic and dosage for serotherapy should be mastered beforehand and no one should be misled into assuming that antitetanus serum can be given like diphtheria antitoxin. Its efficacy lies in prophylaxis and the immunity conferred is transient.

When tetanus is once installed, Weintraud continues, little can be hoped from serum treatment, but we have an important symptomatic aid in Meltzer and Auer's magnesium sulphate treatment. He has been so much impressed with the value of this measure that he urges all medical societies to devote a meeting to it, exhibiting the classic guinea-pig experiment, injecting subcutaneously 7 c.c. per kilogram of weight of a 25 per cent. solution. All the voluntary and involuntary movements of the body are entirely arrested. Unless artificial respiration is applied the guinea-pig dies without any signs of pain or suffocation. The animal lies relaxed without a single manifestation of life except for the heart-beat and blood-pressure which with small doses persist almost normal. Artificial respiration restores normal conditions and the animal seems none the worse for his experience. The animal can be restored also by injecting 5 or 10 c.c. of a 5 per cent. solution of calcium chlorid slowly into a vein in the ear. In twenty seconds the animal begins to breathe deeper, rouses in a minute, and in a short time cannot be distinguished from its normal mates.

This exhibition convinces all of the extreme value of magnesium sulphate in tetanus, but it warns also of its dangers. Too small a dose does no good, and too large arrests the breathing. The individual susceptibility differs also. In the three cases of recovery at Wiesbaden the patients had all been given magnesium sulphate. After a single injection the rigid muscles relaxed, breathing became deeper and freer, cyanosis and sweating subsided, and the patient sank into refreshing slumber. If he is wakened anew by pains and spasms, these can be relieved again by the sulphate. Individual tentative experience must be the guide to dosage. To date, he says, fifty cases of tetanus have been given this treatment, and the mortality of 35 per cent. is being constantly lowered. Kocher lost only one of his six patients, and this one succumbed to sinus thrombosis. The intraspinal technic is scarcely applicable outside of institutional supervision. No one physician can carry it through alone; in one case in his service eight intraspinal injections were given during the week, thus arresting the paroxysms each time as they returned, until finally the tendency was conquered. The general practitioner must content himself with subcutaneous injection. Brilliant results have been attained with it, but even this requires the most devoted supervision, keeping the patient under this long, deep, lasting anesthesia and yet not letting it be so deep that the relaxation paralyzes vital functions. The danger of total arrest of the respiration

confronts one constantly. The aspect, the tint, are no criteria; the breathing must be watched for the slightest tendency to paralysis of the respiratory muscles.

With intraspinal injection the spinal canal can be washed out when the effect is too intense, but with subcutaneous injection no relief is possible in this way, but the drug can be more or less completely neutralized by the antagonistic action of 5 c.c. of a 5 per cent. solution of calcium chlorid, injected intramuscularly, repeated several times at need. Artificial respiration, however, is the main reliance and may suffice alone, especially if preceded by an injection of 1 mg. physostigmin salicylate. If these fail, intratracheal insufflation is within the reach of every one. If there is no oxygen tank available, air can be pumped in with an ordinary bellows. If skilled in intubation technic, tracheotomy can be avoided.

In conclusion, he reiterates that the sulphate does not menace the heart directly, but the heart may need camphor from the exhaustion following the spasms. He does not seem to have had any personal experience with the subcutaneous technic, but cites others to show that the dose should be at least 15 or 20 c.c. of a 20 per cent. solution or 12 or 16 c.c. of a 25 per cent. solution for an adult. Parker injected 28 c.c. of a 25 per cent. solution at a time. Mielke thus cured a girl of nearly 6 with doses of 3 gm. in a 20 per cent. solution three times in twenty-four hours, to a total of twenty-four injections, using up 61 gm. of the drug. Of course, the smallest effectual dose should be used. The relief from the sulphate is so great that the patients pay no heed to the local pain of the injection, but this can be reduced by giving a little morphin.

Unger describes a method of treatment which he has applied in one case with apparent success. Antitetanus serum was injected into the ulnar or radial artery through a ureter catheter, pushed in until the tip reached the arch of the aorta. The serum thus pumped in passed at once to the brain through the carotid arteries and into the spinal cord through the descending aorta. He has often introduced ureter catheters in this way far up into veins and arteries. Heddaeus has recently reported a somewhat similar intra-arterial technic, injecting the antitetanus serum directly into the internal carotid artery. He had applied it in six cases of tetanus with gratifying results.

60. **Cholera.**—Lichtwitz confesses that he has had no experience with cholera, but theoretically is convinced that great benefit might be derived from epinephrin administered intravenously by the drip method, taking two or three hours to inject half a liter of the epinephrin-salt solution, as for peritonitic shock. This replenishes the epinephrin in the circulation as fast as it is eliminated. When this technic is impracticable, the next best is to inject occasionally 100 c.c. of the solution as slowly as possible. Another point which he emphasizes is that when bolus alba or charcoal is used it must not be forgotten that this will absorb and nullify the action of drugs given soon before or with it. It is also liable to absorb and nullify the digestive ferments, and thus impair the appetite.

Medizinische Klinik, Berlin

October 25, X, No. 43, pp. 1607-1632

66 *Serious Injuries of the Eyes in the Field. (Die wichtigsten Augenverletzungen im Krieg und ihre erste Behandlung.) C. von Hess.
67 Vaccination Against Typhoid, Cholera and Dysentery. (Schutzimpfung bei Kriegsseuchen.) H. Lüdke.
68 *Chronic Irritation of the Intestines Secondary to Stomach Disease. (Ueber die vom Magen ausgehenden chronischen Reizzustände des Darmes.) S. Jonas.
69 Whooping-Cough Endotoxin Reaction. (Allergische Reaktion mit dem Bordet-Gengouschen Keuchhusten-Endotoxin.) R. Neurath.
70 Massage in Diagnosis and Treatment of Muscular Rheumatism. A. Müller.
71 Technic for Thiersch Flaps. (Die Transplantation nach Thiersch.) O. Nordmann.
72 Typhoid and Paratyphoid Fever. N. Ortner. Concluded.

66. **First-Aid for Injuries of the Eyes.**—Von Hess says that he has seen a number of cases in which the optic nerve had been cut by a bullet while the eye itself had scarcely been injured. When the eye is injured the first thing is to determine whether it is perforated or not. If the tension of the eyeball is found reduced, on cautious palpation, there is certainly perforation, but this cannot be excluded even if the tension is found normal; the hole may close up behind a minute splinter in the eyeball. A hemorrhage in the anterior chamber is generally absorbed in a week or so, but when the blood penetrates into the vitreous body it is never entirely absorbed. A copper scrap is peculiarly dangerous in the eye, as it rapidly induces aseptic suppuration; when a copper splinter is supposed to be in the eye, the man should be rushed to a specialist with extra speed. Iron or steel scraps, on the other hand, do not threaten special danger for a few days. It may be weeks or months before siderosis bulbi develops. Lead should be got out early.

He says that sympathetic ophthalmia develops only when a chronic iridocyclitis follows on a perforating injury of one eye. The signs of this are discoloration of the iris, a precipitate with tenderness and photophobia and congestion in the ciliary region—evident a week or two after the injury and especially when the ciliary region was involved in it. With these findings the patient had better be advised to have his eye enucleated, as this alone will protect certainly against sympathetic ophthalmia. If the eye suppurates after the perforating injury (hypopyon, panophthalmia), sympathetic ophthalmia need not be feared. A small superficial foreign body can be removed with a small scalpel at need, holding it flat; it does no harm to slice off some of the epithelium around, as this regenerates in a day or so under a well-fitting bandage. At the front, foreign bodies which are not superficial should be left unmolested. No occlusive dressing should be applied to the eye when there is much conjunctival secretion. The eye should not be bandaged except when there is a loss of substance in the cornea or prolapse of the iris. Even after opening a stye, the eye should not be bandaged. Mucous or purulent conjunctival secretion can be combated in emergencies by everting the lids and dabbing them with a 1 or 2 per cent. solution of silver nitrate once or twice a day. This must never be instilled into the eye.

68. **Gastrogenous Diarrhea.**—Jonas tabulates the findings in five cases of achylia, in five of hyperacidity and in five of extreme gastroptosis. Comparison of these groups shows that the behavior of the pylorus in abnormal conditions is what determines whether diarrhea or constipation shall prevail. When it is unduly permeable, as with achylia, subacidity, and in some cases of hyperacidity and atony, there is a predisposition to diarrhea, while the reverse tendency prevails with defective motor functioning of the stomach and bowel and unduly long closure of the pylorus.

Münchener medizinische Wochenschrift, Berlin

October 20, LXI, No. 42, pp. 2089-2124

73 *Increased Pressure in Cerebrospinal Fluid in Certain Eye Diseases. III. (Lumbaldrucksteigerung bei Iritis und Chorioiditis.) L. Heine.
74 *Technic for Serodiagnosis. (Zum Nachweis der Blutfreiheit der zur Abderhaldenschen Reaktion verwendeten Substrate und Seren.) Fetzer and Nippe.
75 *Arrest of Coagulation by Syphilitic Serum. (Ueber die Gerinnungshemmung durch Luessera—Hirschfeld und Klinger—und die chemische Natur des Zytozyms.) E. Fränkel and F. Thiele.
76 Tachysystole of the Auricles and Irregular Pulse. (Rhythmische Vorhoftachysystolie und Pulsus irregularis perpetuus.) H. E. Hering. Commenced in No. 41.
77 *Open Treatment of Suppurating Wounds. (Offene Behandlung eiternder Wunden.) F. Schede.
78 Determination of Typhoid Bacilli in the Stools. (Ueber das Bierastsche Verfahren der elektiven Beeinflussung von Bacterium coli zum Nachweis von Typhusbazillen im Stuhl.) H. Schmitz.
79 Treatment of Traumatic Tetanus with Serous Transudate from the Abdomen. S. Durlacher.
80 Dumdum Bullet Wounds. (Dumdumgeschossverletzung.) Kreitmair.
81 Lint for Dressings. (Scharpie als Verbandmaterial.) F. Brunner.
82 Need for Economy with Cotton Dressings. (Seid sparsam mit den baumwollenen Verbandstoffen!) F. Williger (Berlin).
83 Cross Sections of Arm and Leg. (Querschnitte.) H. Krauss.
84 Prophylaxis of Epidemic Diseases in the Field. (Bekämpfung der Kriegsseuchen im Felde.) A. E. B. Nocht. Commenced in No. 40.
85 Field Dressings and Infection. H. Kümmell.

73. **Pressure on the Brain with Certain Eye Diseases.**—Heine says that if we regard the cornea as a protruding part of the brain, then the meninges are practically continuous with the uveal tract. The first sign of irritation of the meninges is increased secretion of cerebrospinal fluid, and he found this pronounced in over three-fourths of 63 cases of uveitis. The coincidence occurred too regularly for it to be regarded as casual. It testified that with inflammation in the choroid, the iris or the ciliary body, the meninges share in the irritation. In 16 of the 30 cases of iritis, it was of tuberculous origin; syphilitic in 5; gonorrheal in 1; all three in 1; in another case there was sinusitis and in another diffuse atheroma. In the 33 cases of choroiditis, 13 were of tuberculous and 10 of syphilitic origin. Twenty-four of the patients in each group were men. In the 30 cases of iritis one eye only was involved in 23, but only in 8 of the 23 choroiditis cases.

74. **Technic for Serodiagnosis.**—Fetzer and Nippe call attention to the value of the malachite green test in revealing by a change in color the slightest admixture of blood. With the aid of this test it is possible to avoid serious error from the presence of blood in doing the Abderhalden test.

75. **Coagulation Test for Syphilis.**—Fränkel and Thiele confirm the diagnostic importance of the inhibition or delay in coagulation as a sign of syphilis. In seventy cases tested the findings paralleled those of the Wassermann test. The coagulating influence seems to proceed from the ether-soluble fraction of the thrombokinase or cytozyme. Syphilitic serum destroys this, and thus prevents coagulation. (Compare with Abstract 75, page 1241.)

77. **Open Treatment of Suppurating Wounds.**—Schede asks what is the use of trying to keep profusely suppurating wounds bandaged. The body is striving to throw off infected secretions, and why cannot we help it in this task instead of our futile efforts to staunch the copious discharge. Oftener than not, the dressings directly hinder instead of promoting Nature's efforts, while the changing of the dressings threatens the environment. An illustration shows the two plaster casts and iron strip frame between, with which he secured the rapid healing of severe shrapnel injuries of the leg. Almost at once the secretions lost their fetid odor and purulent character, the fever subsided, and necrotic tissue was cast off by healthy granulations. When the secretions are too thick to drip, he steams the wound under a cover and thus obtains a "moist dressing" without the drawbacks of shutting off the air and retention of secretions. In other cases superheated air answers the purpose better. If the suppurating focus is on the top of the leg, he provides for drainage by a counter incision in the depths of the lesion. The great advantage of this plaster-cast open method, he reiterates, is that each lesion can be treated as it needs, open or covered, moist or dry, aseptic or antiseptic, and it can be bandaged at any time when the healing has progressed to render this desirable. The plaster and the iron cost far less than the constantly to be renewed dressings with such a lesion, while the patient is spared all the pain and discomfort of change of dressings.

Wiener klinische Wochenschrift, Vienna

October 15, XXVII, No. 42, pp. 1363-1378

86 *Lumbar Puncture in Chorea. (Lumbalpunktion bei Chorea infectiosa.) F. Passini.

October 22, No. 43, pp. 1379-1398

87 *Dentistry Protheses for the Wounded. (Der Zahnarzt im Kriege.) M. Kraus.

86. **Lumbar Puncture in Treatment of Chorea.**—Passini remarks that the latest text-books have changed chorea from the "diseases of the nervous system" chapter to the chapter on "infectious diseases." Recent research has apparently demonstrated that the choreic movements are the result of irritation of the cerebral tracts passing from the red nucleus to the dentate nucleus. He examined the spinal fluid in a number of cases of chorea developing secondary to acute articular rheumatism; some of the children had signs of having passed through endocarditis, but all were free from fever and the chorea had been under way for several weeks unmodified by any measures. Lumbar puncture in five exceptionally severe cases showed that the fluid was under high pressure, from 30 to 40 c.c. spurting as the patient reclined and still more escaping as the child sat up. The fluid was clear and apparently sterile. In three of these five cases the chorea promptly and permanently subsided after the lumbar puncture. In the two other cases the chorea was of a year's standing and no benefit was derived. The lumbar puncture was repeated later and showed normal pressure, but the choreic movements persisted unmodified. Evidently the part of the nervous system involved had suffered beyond possible recuperation from the overpressure or from toxic elements in the cerebrospinal fluid. Lumbar puncture before irreparable lesions are installed seems to have a direct curative action.

87. **Dentistry Protheses in Military Surgery.**—Kraus concludes his remarks on the necessity for trained assistance in this line for the wounded, by urging that the results are incomparably better when the prothesis is applied early. Healing can then proceed along normal lines and there will be nothing to undo later, while old disfiguring deformity in hard callus is difficult to correct.

Zentralblatt für Chirurgie, Leipsic

October 24, XLI, No. 43, pp. 1609-1632

88 *Treatment of Ascites. II. (Zur Beseitigung des Ascites.) J. Kumaris.

89 *Phenol-Camphor in Local Treatment of Phlegmons in Joint and Tendon Sheaths. (Hochprozentige Karbol-Kampferspiritusinjektionen gegen Phlegmonen in Gelenken und Sehnenscheiden.) G. W. Schiele.

88. **Ascites.**—Kumaris reports here three cases in which the technic he advocates has been applied with perfect success. He excises a patch of the parietal peritoneum and thus induces adhesions. (Described in The Journal, Jan. 31, 1914, p. 421.) One patient died twenty-two days later from erysipelas, and there was no fluid found in the abdomen. The cure was complete when the patient was seen a month later in another case, and also during the six months to date in the third case. This patient was a man of 55. The incision was carried down to the mesentery of the ascending colon, up to the cremaster hepatis and toward the colon on the left. A tongue-shaped flap was then cut in the peritoneum and turned back over the fundus of the bladder, and a wisp of omentum was drawn down into the exposed space of Retzius. A stretch of the prevertebral peritoneum was also loosened up. By the end of forty-eight hours the edema in the ankles had disappeared, the abdomen was free from pain, the walls soft and edematous. There was slight oozing from the upper part of the wound for a few days, and then a subcutaneous infiltration required puncture the fourth and sixth weeks, after which approximately normal conditions were restored and have been permanent to date.

89. **Phenol-Camphor for Phlegmons.**—Schiele writes to corroborate the great benefit from injection of a mixture of 30 parts liquefied phenol with 50 parts triturated camphor in 8 parts alcohol. He has never witnessed anything suggesting intoxication with this treatment, while his invariable success with it has convinced him that practically always it will abort incipient phlegmonous processes in cavities, especially in large and small joints and tendon sheaths, and the method deserves a trial in gunshot wounds and tardy abscesses. Among the typical cases described is that of a young woman with a phlegmon in the sheath of the flexor tendon of a finger. He filled the cavity with the mixture and the tendon could be exercised without pain, and the three incisions healed without impairment of function. The injection was repeated daily, the tendon swimming in the oily fluid. In another case 5 gm. of the fluid was injected into the knee joint every second day after evacuation at first of 150 gm. of purulent secretion. The phlegmon had followed an external injury. The pain and fever disappeared promptly, and by the third day the man of 55 was walking, using the knee.

Zentralblatt für Gynäkologie, Leipsic

October 24, XXXVIII, No. 43, pp. 1345-1368

90 Mechanism of Delivery with Fractured Acetabulum and Dislocation of Head of Femur. A. Mayer.

Zentralblatt für innere Medizin, Leipsic

October 24, XXXV, No. 43, pp. 953-968

91 *Production of Antibodies in Leukemia. (Fähigkeit von Leukämikern Antikörper zu erzeugen.) H. Rotky.

91. **Antibody Production in Leukemia.**—Rotky reports a series of experiments on eight patients with tuberculosis or multiple sclerosis and on two leukemics, testing them all for agglutinating properties in the blood. The findings confirmed in every respect Moreschi's recent statement that the blood in leukemia has no agglutinating power. Rotky accepts this as indicating incapacity for production of antibodies, and suggests that this explains the lack of resisting power in leukemia to otherwise harmless infections.

Gazzetta degli Ospedali e delle Cliniche, Milan

October 18, XXXV, No. 118, pp. 1813-1828

92 Leukemia. (Leucemia e morbi affini.) P. Castellino, A. Ferrata and G. Rummo.
93 Non-Tuberculous Apical Disease. L. Devoto and E. Tedeschi.
94 Gastric Neuroses. A. Ferrannini and F. Schupfer.

October 22, No. 119, pp. 1829-1844

95 Transvesical Prostatectomy. F. Marinelli.

Riforma Medica, Naples

August 8, XXX, No. 32, pp. 871-896

96 The Liver-Pancreas Syndrome in Diabetes. U. Deganello. Commenced in No. 31.
97 Case of Myasthenia Gravis. (Morbo di Erb-Goldflam.) M. Marzemin.
98 Treatment of Acute Rheumatism. G. Paoletti.

August 15, No. 33, pp. 897-924

99 Leukemia, Hemolytic Jaundice and Splenic Anemia. (Sulle emopatie splenomegaliche I.) G. Rummo. Continued to No. 40.
100 The Colloidal Gold Reaction in the Cerebrospinal Fluid. E. Debenedetti and C. Olivero.
101 Postoperative Gastro-Intestinal Hemorrhage. G. Romano.

August 22, No. 34, pp. 925-952

102 Diagnosis and Prophylaxis of Cholera. S. Livierato. Concluded in No. 35.
103 Hemorrhage from Movable Kidney. (Ematuria da rene mobile.) B. Anglesio.
104 Prophylaxis of Trachoma in Schoolchildren. M. Mazzitelli.
105 Malaria in Italy in 1912. A. Celli.

Russky Vrach, Petrograd

June 27, XIII, No. 24, pp. 837-868

106 *Progressive Pernicious Anemia M. P. Mikhailoff.
107 *Cultivation of Tissues Outside the Body. M. V. Veselkin and E. A. Kartashevsky.
108 *Large Doses of Camphor in Pneumonia. M. S. Markevitch.
109 Action of Camphorated Oil on Interchange of Gases. N. A. Beloff. Commenced in No. 9.

July 4, No. 25, pp. 869-900

110 *Astringents and Opium Contra-Indicated with Intestinal Insufficiency. P. P. Brukhanoff.
111 *Roentgen Exposures of the Thymus in the Treatment of Exophthalmic Goiter. S. M. Sinozersky.
112 *Action of Epinephrin on the Blood-Pressure in Typhoid and Pneumonia. S. M. Mansvetova.
113 Trypanosomes in the Blood of Jumping Rodent. G. I. Koltzoff.
114 *Laboratory Anthrax Infection. N. V. Popoff. (Sibersk. yazv.)
115 *Nucleoproteids of Dysentery Bacillus. E. A. Neitz.
116 *Washing the Blood Outside the Organism; Artificial Jugular Pulse. I. P. Mikhailoffsky.

106. **Progressive Pernicious Anemia.**—Mikhailoff reports excellent results from spleen extract in the treatment of pernicious anemia. He produced pernicious anemia in 18 rabbits by injecting phenylhydrazin for four to five days. Ten were left without treatment and 8 of these succumbed by the third to the fifth day. The other 8 rabbits were treated with spleen extract, and in all the blood-picture returned almost to normal. Encouraged by these results, Mikhailoff used this treatment in a very severe case of pernicious anemia in a man of 26, who had had every other known treatment applied without benefit. About 2.5 c.c. of a 2 per cent. solution of an extract of spleen substance was injected and improvement was noticed after the seventh injection and a complete cure obtained after the fiftieth. Six months later the hemoglobin rate was 95 per cent.; the reds numbered 5,125,000; the whites, 6,800; the color index was 0.90. Equally good results were obtained in two other out-patients. Mikhailoff explains the favorable action of the spleen extract in the treatment of pernicious anemia by the presence of hormones which stimulate the functioning of the blood-making organs.

107. **Cultivation of Tissues Outside the Body.**—Veselkin and Kartashevsky claim that if the blood plasma of diabetics reduces the regenerative vitality of tissue, as is apparently evidenced by the serious course of skin lesions in diabetics, then the growth of tissues in plasma of this kind would be inhibited and be different from that in healthy plasma. They experimented on cats whose pancreas had been partially or totally removed under ether. Spleens of kittens were used for cultivation purposes. The spleen tissue showed normal growth in the plasma of both the pancreatectomized cats and the controls, demonstrating that the removal of the pancreas does not affect the regenerative power of the tissue cells, but only reduces the vital resistance.

108. **Camphor in Pneumonia.**—Markevitch advocates the use of 10 per cent. camphorated oil in the treatment of croupous pneumonia in doses of 5 c.c. four times daily or 10 c.c. twice a day of a twice stronger solution. The camphor was given by hypodermic injections combined with digitalis internally. The 226 male patients treated by this method gave 6.6 per cent. mortality, while of 322 treated without camphor 13.3 per cent. died. In 133 grave cases of pneumonia, 66 had no camphor treatment, with 48 per cent. mortality, while of 67 given the camphor as above only 15 died, namely, the mortality rate was only 22 per cent. Camphor thus considerably lowers the death-rate. The temperature usually fell by lysis; if a crisis occurred it was generally on the ninth day, instead of the seventh, which fact Markevitch explains by the gravity of the cases treated. Dyspnea is relieved, the respiration becomes quieter and deeper, the temperature subsides in two or three days; there is no delirium; the sputum decreases, the appetite reappears, and with the improvement of the general conditions recovery sets in. The local pneumonic process is little influenced by this treatment, though the area of consolidation was found diminished. The only by-effects were painful infiltrations at the points of injection, especially when the camphor got into the subcutaneous fat. There was suppuration at the point of injection in only two cases in the four years. Camphor has a bactericidal action, it is slowly absorbed, and thus gradually and quietly brings on lysis.

110. **Diarrhea After Resection of Intestines.**—When part of the intestines are excised, the remaining portions take on themselves the task of the resected part. If the processes of digestion and absorption continue normally, then the intestines are sufficient, but otherwise not. One of the annoying and dangerous signs of intestinal insufficiency is diarrhea. The question arises whether it is not possible to stop such a diarrhea by administering an astringent or opium. To settle this question, Brukhanoff made fistulas at various points along the gastro-intestinal tract of dogs, and studied the digestive processes after short-circuiting the bowel by resecting the jejunum or ileum. He found that with intestinal insufficiency the astringents and opium did not inhibit the passage of food through the intestinal tract, but rather accelerated it, and that these drugs acted unfavorably on digestion and absorption, and did not influence the decomposition of albuminoid substances. Therefore, he concludes, it is not advisable to administer astringents or opium in the diarrhea caused by intestinal insufficiency. The only rational treatment is dietetic.

111. **Roentgen Exposures of the Thymus in Treatment of Exophthalmic Goiter.**—Sinozersky studied on twenty patients with exophthalmic goiter the rôle played in its production by the thymus gland. Some were given Roentgen treatment of the thymus after two or three thyroid vessels had been ligated, but the majority had this treatment before any operative measures. The condition of the thymus gland was estimated by dulness on percussion over the sternum and to the left, after a tumor or aneurysm had been excluded by roentgenoscopy showing a shadow moving up and down the aorta during respiration, and by blood examination—increased num-

bers of lymphocytes (55 per cent.) and reduced polynuclears. Preliminary experiments on young dogs and rabbits showed that exposures to the Roentgen rays cause atrophy of the thymus. Roentgen treatment of Basedow's disease, directed against the thymus, with exposures every three or four days, gave marked improvement after five or six sittings. The pulse fell to 80 from 120 or 140; the goiter, the sweating, nervousness and exophthalmos decreased and the blood showed a decrease in the number of lymphocytes and increase of the polynuclears. As the skin in Basedow's disease is very sensitive to the Roentgen rays, an interval of three weeks is necessary before entering on another series of exposures. His conclusions are that the rôle of the thymus gland in the pathogenesis of exophthalmic goiter is established now beyond question.

112. **Epinephrin in Typhoid and Pneumonia.**—Mansvetova used epinephrin in infectious diseases, pneumonia, typhoid and paratyphoid, to improve the heart action. In order to determine the necessary dose of the 1 per thousand solution of epinephrin, she injected hypodermically 0.5 c.c. in 13 patients; 0.75 c.c. in 10 patients, and 1 c.c. in 7 patients. She found that 1 c.c. caused a rapid and considerable rise of the blood-pressure during systole, while the diastolic decreased; 0.75 c.c. also raised the blood-pressure, but more gradually. The action is rather inconstant; the systolic increases, the diastolic falls. The dose of 0.5 c.c. caused a less pronounced increased blood-pressure, and in these doses, given every hour and twenty minutes or every ninety minutes, the weakened circulation could be maintained for a long time. These small doses do not affect the peripheral circulation, but cause dilatation of the coronary arteries of the heart, thus improving the circulation in the cardiac muscle and its nutrition. The larger dose of 1 c.c. is indicated when a rapid rise in the blood-pressure is necessary, as, for instance, in postoperative shock, collapse or acute poisoning, but in acute infections so large a dose should not be used, as the heart under the toxic influences may be unable or too weak to respond to such a dose.

114. **Laboratory Anthrax Infection.**—Popoff reports a case of fatal septicemic anthrax of the left bronchus in a patient who had contracted this disease in a laboratory in which anthrax vaccine was prepared. The organs showed parenchymatous changes, such as are caused by any toxemia. He concludes that death from anthrax is caused not by mechanical, but by toxic influences, and that the infection may take place sometimes through aspiration or inhalation. Prophylactic vaccination against anthrax, serodiagnosis and serotherapy are of tremendous importance, especially in Russia, he says, where in the army 61 persons die annually from this cause on an average, and during the years 1904 to 1908, 80,498 persons and 218,956 horses and cattle throughout Russia were affected with it.

115. **Nucleoproteid of Dysentery Bacillus.**—Neitz obtained from bodies of Shiga-Kruse bacilli an albuminoid substance with the chemical properties of a nucleoproteid. The latter proved to be extremely toxic for dogs and rabbits, as death would occur on the second or third day after injection into rabbits in the ear, abdominal cavity or under the skin. The temperature falls by 5 or 9 degrees C., general convulsions set in, collapse, dyspnea and paresis of the hind limbs make up the clinical picture of poisoning, with frequently diarrhea two or four hours after the injection of the nucleoproteid. The blood culture always proved negative. The serum of animals immunized by repeated injections of dead Shiga-Kruse bacilli (heated to 60 or 65 C.) precipitates the nucleoproteid from its solution. The serum of rabbits rendered immune by repeated intravenous injections of 1 per thousand nucleoproteid solutions agglutinates Shiga-Kruse bacilli, but no other type of dysentery bacilli.

116. **Washing the Blood.**—Mikhailoffsky connected with long tubes the upper end of a bottle with the right femoral artery of a dog and the lower end with the right external jugular vein. The bottle was filled with Locke's fluid. Having removed the clamps, he let the arterial blood run into the bottle, and from the latter pass with the Locke's fluid back into the jugular vein. When a fourth of a liter of blood had been let out, he connected the femoral artery directly with the jugular vein through a tube 40 inches long, and he could see and feel the pulsation of the jugular vein—an actual artificial pulse. The Locke's fluid saturated with blood was then replaced by a new quantity of the same fluid, without blood, and the experiment was repeated. About two-thirds of a liter of blood was thus removed, and neither the pulse nor the respiration showed change. These experiments suggest that Locke's fluid may replace normal blood, preventing its coagulation in vitro, that the blood may be greatly diluted with it without fatal complications for the animal, that an artery may be directly connected with a distant vein, no thrombus forming, and that an artificial venous jugular pulse may be obtained, and that the blood may thus be safely washed out in uremia, cholemia, snake poisoning, ptomain poisoning, etc.

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117 *Convulsions in Whooping-Cough. (Om krampe ved Kighoste.) S. T. Sørensen.

October 28, No. 43, pp. 1297-1320

118 *Radiotherapy of Lupus and of Bone and Joint Tuberculosis. (Om Anvendelse af kunstige Lysbade ved Lupus vulgaris og kirurgisk Tuberkulose.) A. Reyn and N. P. Ernst. Concluded in No. 44.

117. **Convulsions in Whooping-Cough.**—Sørensen has noticed that when convulsions occur in the course of whooping-cough they are generally accompanied by fever which may run very high. This suggests that the same cause inducing them may have a paralyzing action on the heat-regulating center. In the 26 cases he has encountered, 21 terminated fatally; the convulsions in 15 of the fatal cases developed once at the beginning of the disease, five times in the second and five times in the fourth week, and once the third, fourth, sixth and eighth weeks. The date is not known in 6. Only 5 patients with the convulsions recovered, but in the majority of the fatal cases death was due to pertussis pneumonia, the convulsions being secondary to this when they did not develop until the fourth week or later. One child of 3 had fever and cramps in his arms with meningitic symptoms and unilateral facial paralysis for ten days before the pertussis manifested itself. As this developed, the other symptoms subsided completely. In only one other case were there symptoms on the part of the meninges, and both these children were 3 and 5; all the others were infants. In one of the few cases that came to necropsy, thrombosis in the longitudinal sinus was pronounced, but the bacteriologic findings were negative. The children who had convulsions were all without exception of the spasmophilia type, the nervous system unstable.

118. **Radiotherapy of Lupus and Bone and Joint Tuberculosis.**—Reyn and Ernst give a number of illustrations "before and after" treatment in forty-two cases of lupus, all but five being very old and mutilating cases. They prefer to call this method of treatment artificial heliotherapy, as their aim is to use a light which resembles direct sunlight as closely as possible, and this they think is the carbon arc light. Of the thirty-seven cases rebellious to all previous measures, nine were completely cured and twenty remarkably improved, and the improvement is still continuing. Two of the patients died soon after the treatment had been begun; the interval since has been too short in the other cases for estimation of the final outcome. They were much impressed with the improvement in the general health under the artificial heliotherapy. The universal chemical light bath was Finsen's ideal, they state, rather than intensive local exposures to the light. The light baths were given daily or two or three times a week; some patients were cured with fifty-one exposures; the one requiring the longest course had 208. The baths were never over two and a half hours in duration.

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October 22, LXI, No. 43, pp. 1837-1892

119 Dwarf Growth from Fetal Chondrodystrophy. (Om Dværgvaekst som Folge af Chondrodystrofia foetalis.) V. Poulsen.

120 The Food in the Prisons of Germany and Denmark. (Fængselskost.) A. Erlandsen.